

Appendix D – Fish Handling Plan

The plan included in this appendix was generated specifically for Kiewit-General's pontoon production operation. It has been provided purely as a reference document to inform future operations.

**SR 520 Pontoon Construction
Design-Build Project**

Fish Handling Plan

Prepared By:

Kiewit-General, A Joint Venture

Prepared For:

Washington State Department of Transportation

February 21, 2013



Approved By WDFW 4/1/2013



State of Washington
DEPARTMENT OF FISH AND WILDLIFE

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April 1, 2013

Washington State Dept. of Transportation
Dave Ziegler
PO Box 1928
Aberdeen, WA 98520

Dear Mr. Zeigler,

SUBJECT: SR 520 Pontoon Construction Project; Request for Approval of Revised Fish Handling Plan and HPA Modification; Chehalis River Tributary to Grays Harbor; NW 1/4 Section 17, Township 17 North, Range 09 West, Grays Harbor County, WRIA 22.9000, WDFW Log No. 121776-05

The Washington Department of Fish and Wildlife (WDFW) received the above-referenced request on February 25, 2013. Upon review of the revised Fish Handling Plan, dated February 21, 2013, WDFW approves the revised Fish Handling Plan to be implemented beginning with the second float out, tentatively scheduled for April/May 2013. WDFW appreciates the amount of work that was invested into revising the Fish Handling Plan after a review of the "Lessons Learned" during the first float out. WDFW approves this revised Fish Handling Plan with the understanding that WDFW shall have the opportunity to review and approve any future revisions of the Fish Handling Plan. Hydraulic Project Approval (HPA) 121776-05 will reflect the approval of the current revised plan, and shall be incorporated and referenced within the provisions. If future revisions of the Fish Handling Plan are needed and are approved by WDFW, the HPA shall need to be revised as well, to reflect the change in the Fish Handling Plan.

If there are any further questions, please don't hesitate to contact me at 360-249-1228.

Sincerely,

A handwritten signature in cursive script, appearing to read "Amy Spoon".

Amy Spoon
Area Habitat Biologist
WDFW – Habitat Program

Cc: Stephen Kalinowski, WDFW
Dave Kloempken, WDFW
Curt Holt, WDFW
Chris Cziesla, WSDOT
Dave Davies, WSDOT



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Abbreviations/Acronyms

| Abbreviation/ Acronym | Definition |
|----------------------------------|--|
| BO | Biological Opinion |
| DO | Dissolved Oxygen |
| Ecology | Washington State Department of Ecology |
| ESA | Endangered Species Act |
| FHWA | Federal Highway Administration |
| HCS | Hydraulic Control Structure |
| HPA | Hydraulic Project Approval |
| MOA | Memorandum of Agreement |
| NMFS | National Marine Fisheries Service |
| ppm | Parts Per Million |
| Project | SR 520 Pontoon Construction Design-Build Project |
| QIN | Quinault Indian Nation |
| SR | State Route |
| TSS | Total suspended solids |
| USFWS | U. S. Fish and Wildlife Service |
| WAC | Washington Administrative Code |
| WDFW | Washington State Department of Fish and Wildlife |
| WDNR | Washington State Department of Natural Resources |
| WSDOT | Washington State Department of Transportation |



1.0 Introduction

This document presents the Fish Handling Plan for the flooding of the casting basin and pontoon float outs associated with the State Route (SR) 520 Pontoon Construction Design-Build Project (Project). This Fish Handling Plan has been prepared to ensure compliance with the project Hydraulic Project Approval (HPA) from Washington State Department of Fish and Wildlife (WDFW) and the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) Biological Opinions (USFWS 2010 and NMFS 2010), as these permits and approvals have conditions applicable to fish handling activities associated with pontoon float-out cycles. The Fish Handling Plan will also ensure compliance with or meet the intent of the Washington State Department of Transportation (WSDOT) Fish Handling and Exclusion Protocols (WSDOT 2009).

The fish handling activities associated with the six anticipated pontoon float-out cycles are defined in the above-referenced permits as fish collection activities. The float-out cycle consists of three phases—flooding of the casting basin to float the completed pontoons, float out of the pontoons, and gate closure and draining of the casting basin—where the risk and level for harm to various species will be associated with the potential for fish to move into the casting basing prior to the gate closure and draining of the casting basin.

Following the cycle one float-out event, WSDOT and Kiewit-General identified “lessons learned” that would be considered for future float-out and fish handling events. The lessons learned were discussed with the Federal Services, WDFW, Washington State Department of Ecology (Ecology), and the Quinault Indian Nation (QIN) for their input. This Fish Handling Plan has been modified since the first float-out event to incorporate changes to the operational procedures and equipment that were determined by Kiewit-General, WSDOT, the Federal Services, WDFW, Ecology, and the QIN to address the lessons learned.

1.1 Site Location and Project Description

WSDOT has constructed a casting basin facility to fabricate concrete pontoons within the 58-acre Aberdeen Log Yard property, which includes the launch channel and an adjacent Washington State Department of Natural Resources (WDNR) lease area, at 1301 West Heron Street, Aberdeen, Washington (hereafter “Aberdeen Log Yard site”) in Grays Harbor County (Figure 1.1). The property is located within Aberdeen tidelands on the north shore of Grays Harbor near the mouth of the Chehalis River (Sections 8 and 17, Township 17 North, and Range 9 West of the Willamette Meridian; Latitude



46.9661972 and Longitude 123.8263352). The property is bounded by a Port of Grays Harbor facility to the west, the City of Aberdeen Wastewater Treatment Plant to the east, and the Puget Sound & Pacific Railroad mainline and siding run to the north.

The Project is part of the SR520 Bridge Replacement and HOV Program. WSDOT has contracted Kiewit-General as the design-builder to construct the casting basin facility, including the adjacent launch channel and the concrete pontoons. The completed pontoons will then be launched from the casting basin into Grays Harbor.

The complete construction of the casting basin facility, and fabrication and float out of the pontoons is scheduled to take approximately 3 years. Up to six pontoons will be constructed in each pontoon fabrication cycle. Six fabrication cycles are expected, each lasting approximately 6 months.

2.0 Purpose

The Fish Handling Plan purpose is directed at minimizing the impacts to fish while meeting the requirements of the project WDFW HPA, the USFWS and NMFS Biological Opinions (BOs), and the Memorandum of Agreement (MOA) that was concluded with the QIN. The Plan will also meet the intent of the WSDOT Fish Handling and Exclusion Protocols. These documents include provisions for efforts to minimize impacts to fishery resources. The MOA with the QIN has provisions to protect the operation and sustainability of tribal fisheries by utilizing consultation protocols to achieve meaningful communication between the QIN, WSODT, and Kiewit-General. The objectives of the fish handling procedures described in this plan are: (1) to avoid and minimize adverse effects to fish species during the six pontoon float-out events in accordance with WSDOT's Fish Exclusion Protocols and Standards (WSDOT 2009), and (2) to prevent injuries to site workers and Fish Herders during the float-out activities. This plan describes how entrapped fish will be removed from the casting basin following the pontoon float-out events, while ensuring worker safety.

Another objective of the Fish Handling Plan is to ensure that fish impact assessments and reporting requirements are met. The procedures outlined in this Plan will ensure that the incidental take limits are not exceeded and operations are adapted in a timely and suitable manner if unplanned outcomes occur.

2.1 Regulatory Context

Through a Section 7 Endangered Species Act (ESA) consultation, the Federal Highway Administration (FHWA) received BOs from USFWS and from NMFS that granted incidental take for select endangered species that may be harmed or killed during the



pontoon float-out activities. Section 5.0 further defines incidental take and how it relates to the specific regulatory and permitting requirements for the Project. Fish handling activities are also regulated by WDFW. A modification to the project HPA will be issued in spring 2013 that will include a condition requiring work to be conducted in accordance with this Fish Handling Plan.

2.2 Float Out and Fish Handling Overview

The pontoon float-out cycles will begin with flooding of the casting basin using the sluice gates. The gate, composed of three individual sections, will then be removed. After the gate is removed, pontoon float-out will begin. If there is a significant delay between gate removal and pontoon float out, Kiewit-General will work with the WSDOT directing biologist to determine adaptive management measures that could be taken to reduce fish entry to the basin. Following pontoon float out, the block net will be installed outside of the casting basin gate. A seine net will then be drawn through the basin from the north end heading south toward the gate and bulkhead wall. As the seining operation approaches the gate, the block net will be temporarily removed to allow passage of the seining operation. Once the seine net and its operators have safely passed through the basin entrance, the block net will be replaced to prevent fish re-entry into the casting basin. After the seining operation is complete and the block net is replaced and the tides are appropriate, the casting basin gate will be set back in place. Submersible pumps will then draw the water down to a level of 30 inches through a NMFS-compliant fish screen. The velocity across the screen will be monitored and maintained not to exceed 0.4 feet per second, compliant with NMFS guidelines. Fish trapped in the casting basin will then be herded with a power crowder from the back of the casting basin (north end) to the front (south end) at the gate. Once the fish are moved to the front of the casting basin, trained personnel (Fish Herders) will manually crowd the fish to a fish box, which will be used to transfer fish from the casting basin to the harbor. Once the water level in the casting basin is at 30 inches, it is expected to take between 10 and 12 hours to remove the fish and draw down the remaining water. Through implementation of this Fish Handling Plan, Kiewit-General and WSDOT will work to minimize the fish take caused by entrainment, capture, and handling during the pontoon float-out cycles. Operational fish handling details can be found in Appendix M. Further details on fish exclusion, minimizing fish harassment, and fish handling are described in Sections 6.0 and 7.0, below.

This plan is organized into the following sections:

- Staff qualifications, roles, and responsibilities
- Worker safety requirements



- Fish handling requirements
- Casting basin features relative to fish handling
- Sequence of activities: basin flooding, pontoon float out, draining, and fish handling
- Fish monitoring
- Notifications
- Reporting

3.0 Staff Qualifications, Roles, and Responsibilities

Staff roles and responsibilities during the float-out and fish handling activities will be divided between Kiewit-General and WSDOT. Kiewit-General will be responsible for all fish handling operations. The Kiewit-General General Superintendent will oversee all operations during the float-out cycles. WSDOT will be responsible for fish monitoring, enumeration, and identification under the supervision of the WSDOT Directing Biologist.

Table 1. Key Roles and Responsibilities

| Name and Title | Responsibilities |
|---|--|
| Project Director | <ul style="list-style-type: none">– Overall project responsibility– Adaptive management |
| General Superintendent | <ul style="list-style-type: none">– Management of casting basin operations, during draining and fish handling– Adaptive management |
| Environmental Compliance Manager | <ul style="list-style-type: none">– Oversees job-specific environmental compliance program, basin water sampling, and testing– Ensures permit compliance |
| WSDOT Directing Biologist | <ul style="list-style-type: none">– Oversight of fish monitoring, enumeration, and identification– Adaptive management |
| Fish Handling Operations: Kiewit-General Staff | <ul style="list-style-type: none">– Opening and closing of the casting basin gate– Seine net, block net– Power crowder operations– Fish box operations– Skiff operations |
| Fish Herders: Kiewit-General Staff | <ul style="list-style-type: none">– Manual fish herding and crowding |



| Name and Title | Responsibilities |
|-------------------------------|--|
| Fish Monitors: WSDOT Staff | <ul style="list-style-type: none">– Counting and enumeration of fish in the casting basin– Identification of listed species |

Note: Refer to Appendix N for the current designations and contact information. The contact information in Appendix N will be updated prior to float out.

Kiewit-General staff will be responsible for the mechanical operation of fish deterrent methods (setting the block net), preliminary fish removal (pulling the seine net through the basin), removal and replacement of the casting basin gate structure, the power crowder, manual crowding, herding, and collection of fish, crane-assisted movement of the fish box from the casting basin to the harbor, the harbor skiff, and all other mechanical equipment. During these activities, Kiewit-General will have assistance and involvement from WSDOT.

The Kiewit-General staff and sub-contractor (consultant) staff that will perform manual fish herding will be required to have fish handling training prior to the fish handling activities. In place of training their current employees, Kiewit-General may decide to temporarily hire fish handling staff from an outside resource to assist with fish handling during the float-out cycles. When necessary, the Fish Herders will manually net fish using a dip net or pole seine nets to move them. The Fish Herders will perform the following activities during pontoon float out:

- Herd fish off of the access ramp located at the back of the casting basin.
- Herd and move fish from behind the power crowder, before the power crowder has been lowered into the casting basin.
- Watch for fish that may jump over the top screen of the power crowder during operation and when possible, capture and move the fish back to the area of herded fish.
- Manually crowd and herd fish out from the casting basin gate structure area and place partitions once an area of the casting basin gate has been cleared.
- Manually crowd and herd fish from the east side of the casting basin towards the fish box once the power crowder has stopped 4 feet from the casting basin gate.
- Potentially segregate predatory fish from smaller fish by manually capturing and temporarily placing the predatory fish in the sluice gate area or transporting to a release site.
- Immediately capture and release ESA-listed species to the harbor, including bull trout, green sturgeon, and eulachon.



- Herd fish into the fish box, with multiple passes, if necessary.
- Aid in the transfer of the fish box from the casting basin to the harbor for the deposition of fish.

Some fish will be manually herded into the fish box without actual handling, while other fish will require manual handling with nets. Manual capturing of fish using a dip net is expected for the fish that get trapped in the casting basin gate area and the predatory fish that are segregated into the sluice gate area. Manual capture of fish may be required if fish jump over the power crowder, but during the first pontoon float out cycle no fish were observed to jump over the power crowder. Fish that get trapped behind the power crowder will be captured by directing the fish to the fyke net system (refer to Appendix M).

Fish monitors will observe the fish removal activities, collect fish data, and document any fish that are incidentally injured or killed following the protocols described in Sections 7.0 and 8.0, below. Fish monitors will be qualified biologists possessing the necessary knowledge, training, and experience needed. Fish monitors can be either WSDOT staff or under contract to WSDOT.

Up to four Fish Monitors will be present during the float-out cycles, including the WSDOT Directing Biologist. Fish monitoring outside the basin will take place from a temporary floating dock located on the west side of the launch channel, directly adjacent to the permanent steel whaler system. Fish monitors will monitor for injured, distressed, or dying fish as the fish are released into the harbor. The other Fish Monitors will count fish once they are released into the fish monitoring pens from the fish box (refer to Section 8.1 below). The Fish Monitors and WSDOT Directing Biologist will estimate the appropriate number of fish that should be in the fish box prior to transfer to the harbor. The Fish Monitors will also assist in determining what predator fish should be separated from smaller fish and temporarily moved to the sluice gate holding area. The Fish Monitors will identify any ESA-listed species and WSDOT and Kiewit-General will work together to remove them from the casting basin as soon as possible and with as little handling as possible. The Fish Monitors will record their observations and follow the reporting procedures outlined in Section 10.0.

Due to safety concerns, as few people as possible will be present in the casting basin during float out. Therefore, observation by agencies or QIN representatives will occur from outside the casting basin. The observation point will be located at a safe location on the decking along the crane rails or along the casting basin gate. The observation point will provide outside observers with a reasonable ability to view the operation, including the observation of fish handling equipment, to ensure it is operated within the



standards set forth in the HPA, the BOs and this Plan. WSDOT's Fish Monitors will have access, pursuant to approved safety plans, to conduct monitoring at appropriate points above or within the basin as conditions require. WSDOT will provide a communication device, if necessary, so that fish observers can ask questions and directly communicate with the WSDOT fish monitors.

Through development and implementation of this plan and coordination with the agencies, Kiewit-General will be prepared to remove all fish from the casting basin safely and with minimal handling. Should adjustments to the plan be required during fish handling operations, adaptive management for fish removal is the joint responsibility of the General Superintendent and the WSDOT Directing Biologist. If the Directing Biologist or General Superintendent identifies the need for adjustments to address concerns regarding operations, safety, or fish health, the Directing Biologist and General Superintendent will discuss to identify and implement adaptive management actions. As appropriate, adaptive management techniques will be discussed with USFWS, NMFS, WDFW and QIN representatives according to each party's responding interest and ability to participate prior to implementation.

Roles and responsibilities for reporting are discussed in Section 10.0 below.

4.0 Worker Safety Requirements

The Fish Handling Plan was developed in accordance with the Kiewit-General Project-Specific Safety Plan. This plan was developed by the team with the understanding that the safety of people involved is a vital objective. Kiewit-General believes this plan provides a balance between the safety of the personnel and protection of aquatic life.

Work in the casting basin during the fish handling activities includes the manual fish herder operations and power crowder assembly, positioning, and advancement (Appendix B). The depth of water in the casting basin during fish handling will be set at 30 inches, which was determined by Kiewit-General and WSDOT and accepted by WDFW to be a safe working depth. More water in the basin would reduce the ability of the Fish Herders and Fish Monitors to see through and wade through the water safely. Less water would also create a potential hazard to the fish. The floor of the casting basin has a non-slip finish to minimize slipping. Fish handling activities will be conducted with as few people in the water as possible.

The equipment for the fish handling operations will be chosen to minimize hazards to workers. All equipment will be operated by Kiewit-General-designated operators. The plan uses pneumatic winches for the primary advancement of the power crowder. The pneumatic winches allow for more controlled movement of the power crowder without



introducing additional heavy equipment into the basin. During float out cycle one, the power crowder winch cables were drawn across the basin using a work skiff, causing noticeable sediment agitation. In efforts to minimize sediment disturbance, beginning in cycle two, the plan will be modified to utilize a pre-staged messenger line, thereby eliminating the skiff from this portion of the operation. The pre-staged messenger line will be a floating line that will be drawn from the power crowder to the south end of the basin through a capstan mounted on the power crowder counterweights (Ecology blocks) near the bulkhead wall. Additionally, general purpose skiff use will not be allowed during fish handling activities in the casting basin, but will be reserved for cases of emergency use.

In cycle two, the fish consolidation and collection point will be relocated to the west side of the basin, near the west jamb. Moving the collection point from east to west will provide the fish handling team with safer access to the revised release point. The revised release point will be the floating temporary dock located on the west side of the launch channel, directly adjacent to the permanent whaler system. Access to the collection point at the west end of the basin will be accommodated by the permanent ladder system installed on the west jamb. Revising the release point to the floating dock will also provide the fish handling team with better opportunity to observe fish activity upon release. Additionally, if it is necessary to expedite release of a particular fish, or group of fish, accessing the launch channel via the floating dock will reduce the time necessary to complete the activity. Once again during cycle two, pick points on the fish box will allow rigging to be attached to the box. The fish box will be picked using the crane staged on the permanent trestle, which will hoist the box from the basin floor and swing it over the bulkhead wall into the launch channel where the fish will be released into the water. A Kiewit-General pick plan will be prepared in advance of fish handling operations to analyze the crane pick and ensure it is completed safely. A designated Kiewit-General rigger will be responsible for all rigging.

The fish handling operation has numerous safety hazards. Some of the major safety risks of the fish handling operation include; power crowder operations, working in and around water, and crane operations. Other factors to consider consist of clarity of water and tripping hazards both within, as well as outside the casting basin. In accordance with the Kiewit-General Project-Specific Safety Plan, the risks will be identified in a hazard analysis prior to fish handling activities and procedures will be developed to mitigate those risks. Prior to commencement of work, all parties involved in the operation must participate in developing, reviewing, and signing the operational hazard analysis. Additionally, the Kiewit-General General Superintendent overseeing the fish handling operation will have the authority to stop work immediately at any time if the



safety protocol is not being followed or implemented correctly, or if new, otherwise unidentified hazards are present.

5.0 Fish Handling Requirements

Fish handling has been documented to cause stress, injury, or mortality to fish (NMFS 2010) and through coordination with USFWS, NMFS, WDFW, Ecology, and the QIN, Kiewit-General has developed this plan to minimize harm to fish. This plan has been prepared in accordance with the requirements, terms, and conditions outlined in the USFWS and NMFS BOs and the WDFW HPA.

5.1 Regulatory Requirements

The USFWS and NMFS BOs and the WDFW HPA identify specific regulatory requirements that this Fish Handling Plan is designed to meet. These regulations were reviewed in preparation of this plan and key regulations are discussed below.

- A modification to the project HPA will be issued in spring 2013 that will include a condition requiring work to be conducted in accordance with this Fish Handling Plan.
- Kiewit-General and WSDOT will ensure that a qualified biologist (the WSDOT Directing Biologist) oversees the fish handling activities and implementation of the Fish Handling Plan.
- Kiewit-General will use trained staff for the fish handling roles. Trained WSDOT biologists (Fish Monitors) will oversee fish handling operations and identify and enumerate fish.
- The velocity of water across the pump and sluice gate screens have a maximum intake velocity of 0.4 feet per second and are designed to prevent fish injury. The screens will be in compliance with NMFS standards.
- Species of fish listed under the ESA will be released back to the harbor water as quickly as possible once identified and captured. Non-target species will be returned to the water in a fashion that will not injure them or cause mortality.
- Reporting requirements are discussed below in Section 10.0.

5.2 Fish and Casting Basin Conditions

The Grays Harbor estuary provides rearing habitat and a migration corridor to several species of anadromous salmonids, including Chinook (*Oncorhynchus tshawytscha*),



coho (*O. kisutch*), chum (*O. keta*), and steelhead (*O. mykiss*). Six rivers and many small creeks and streams drain to the estuary and provide spawning and rearing habitat for these fish. There are both naturally spawning populations and hatchery stocks of these species in the Grays Harbor watershed. This produces a complex temporal and spatial distribution of juvenile outmigrants from the system. None of these salmon species have stocks from Grays Harbor that are listed under the Endangered Species Act (ESA). Bull trout (*Salvelinus confluentus*)—recognized under the broader native char category with Dolly Varden (*S. malma*)—are, however, listed as threatened under ESA, and they are encountered occasionally in Grays Harbor, but there are no known spawning populations in the watershed (Simenstad and Eggers 1981, Jeanes and Morello 2006). Additional information on Grays Harbor fish species that may be encountered during the pontoon float-out cycles are discussed in Section 8.0 below and are listed in Appendix G. A description of the timing of salmonid occurrence in the estuary and a fish migration window chart are included in Appendix H. To minimize the number of fish that become trapped in the casting basin and then handled, Kiewit-General will use a block net as a fish deterrent and seine nets to encourage fish to voluntarily leave the basin following float out. Kiewit-General will place the block net on the outside of the casting basin entry as soon as the last pontoon clears the basin threshold. The block net will remain in place until it is needed to be moved for the seine net to be passed out of the basin. At this point, it will be removed and immediately replaced once the seine net and operational personnel have safely cleared the area. If there is a significant delay between gate removal and pontoon float out, Kiewit-General will work with the WSDOT directing biologist to determine adaptive management measures that could be taken to reduce fish entry to the basin.

Kiewit-General will ensure that the water quality conditions in the casting basin and fish box are adequate to hold and transport captured fish species (refer to Appendix L). Prior to flooding the basin and float out, the pontoons will be pressure washed and the floor will be washed and swept. The wash water will be pumped to the treatment system and debris removed to control pH level and to ensure that no debris enters the harbor. Kiewit-General will monitor dissolved oxygen (DO), total suspended solids (TSS), and temperature levels within the casting basin at a minimum of 1-hour intervals when fish are potentially present, as described in the Casting Basin Water Data Collection Plan (Appendix L). Additionally, Kiewit-General will monitor DO and temperature in the casting basin once it is flooded but prior to opening the casting basin gate. When conditions warrant, Kiewit-General will monitor DO and temperature outside the casting basin in the harbor prior to flooding the basin to ensure conditions are adequate for fish survival when they are released. It is unlikely that the pH level, water temperature, or DO levels in the casting basin will be an issue during float out due to the large volume of water. DO will be maintained at 7 parts per million (ppm) or higher and not fall to less



than 5 ppm when fish are potentially present. The fish box will also have an aeration system in order to maintain sufficient oxygen levels.

Other key casting basin design elements and procedures that ensure Kiewit-General meets regulatory requirements include:

- Casting basin submersible pumps will be screened to be compliant with the NMFS screen guidelines (NMFS 1997). The casting basin intake structure is also designed to control velocity and prevent fish entrainment. Maximum flow velocity of no greater than 0.4 feet per second will be maintained at all times that fish may be present within the casting basin, including draw down of the final 30 inches of water.
- Because of brackish/marine water, electrofishing will not be used for the Project.
- ESA-listed fish (bull trout, green sturgeon, or eulachon) encountered during fish handling will be released back into the harbor as quickly as practical. Any ESA-listed fish captured with nets will be transported to the release site immediately.
- Predatory fish may be hand segregated from smaller fish using dip nets at the discretion of the Fish Monitors and WSDOT Directing Biologist. The predatory fish will be kept in the sluice box area until release, except for bull trout, which will be immediately released to the harbor.
- The fish box will be transferred to the harbor directly outside the casting basin to the fish release holding pen adjacent to the floating dock for the release of fish. If the harbor water quality conditions (i.e., temperature, DO, or turbidity) are not adequate for the survival of the released fish, based on consultation with the WSDOT Directing Biologist, the General Superintendent and the WSDOT Directing Biologist will use adaptive management to develop a plan to transport the fish and release them in a more favorable location.

5.3 Fish Stress or Kills

If during the float-out and fish handling activities, Kiewit-General observes, or is made aware by others of fish in distress or dead fish, they will stop work and notify WSDOT. WSDOT will then notify the WDFW Habitat Program and Ecology, as described below in Section 9.0. Incidental take has been authorized for this Project through the ESA consultations with NMFS and USFWS for ESA-listed species that may become entrapped in the casting basin, including green sturgeon, eulachon, and bull trout. In cooperation with WSDOT, Kiewit-General will document all green sturgeon, eulachon,



and bull trout encountered in the casting basin and follow the appropriate notification requirements outlined in Section 10.0.

5.4 Take

The fish handling activities associated with the float-out cycles are defined in the permits as fish collection activities. "Take" is defined as a "collection activity" that would "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, obtain, or to attempt to engage in any such conduct," against fish (ESA Section 3(19); U.S.C. 1973). Under the Washington Administrative Code (WAC) 220-20-045, "collect" is defined as "to take control of or attempt to take control of wildlife or their nests and eggs." "Incidental take" is defined in the BOs and "refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or applicant" (50 CFR 402.02). The USFWS and NMFS BOs exempt take as defined in the terms and conditions of the BOs. .

Take was granted by NMFS and USFWS for ESA-listed fish as summarized below:

- NMFS granted take for 12 adult or subadult green sturgeon that would potentially be captured in the casting basin during the 6 pontoon launchings (2 sturgeon per float-out cycle).
- NMFS granted take for 12 adult eulachon that would potentially be captured in the casting basin during the 6 pontoon launchings (2 eulachon per float-out cycle).
- The USFWS does not expect bull trout will be entrained within the casting basing during each cycle, but they do expect that at least four individual subadult or adult bull trout may become entrained over the total of six cycles. USFWS granted incidental take in the forms of harm for one subadult or adult bull trout to suffer physical injury or mortality, and incidental take in the form of harassment for no more than three bull trout to experience stress not reaching the level of physical injury (i.e., one bull trout will be harmed and three will be harassed during the projects duration of the six float-out cycles).
 - USFWS does not expect fish entrainment, capture, and handling in the casting basin to have a measurable effect on the bull trout's available prey base.

To minimize take from fish handling, Kiewit-General will follow the reasonable and prudent measures outlined in the NMFS BO, which includes following the intent of WSDOT Fish Exclusion Protocols and Standards (WSDOT 2009). Kiewit-General will also monitor for incidental take and reporting of take will follow the procedures in



Section 10.0. If take estimates are exceeded, re-initiation by WSDOT and FHWA will occur with the Federal Services as described in the BOs.

6.0 Casting Basin Features Relative to Fish Handling

Several features of the casting basin have been developed for the purpose of fish handling and to include fish handling equipment. A 4-foot wall around the perimeter of the casting basin provides a surface for the edge of the power crowder to run against. All drains will accommodate a screen to be installed during float-out operations to prevent fish entrainment. The casting basin floor has a non-slip surface to minimize the potential for slip when wet; however, much of the casting basin floor will be covered with plywood, which will serve as a bond breaker on the bottom of the pontoons to ensure that they will release from the basin floor during float-out operations. The casing basin also has an access ramp at the back of the basin (refer to Figure 6.1 and Appendix A).

The power crowder has several sets of wheels for movement and is composed of fabricated truss sections. A 4-foot-high perforated screen is mounted to the front of the power crowder. The screen will be designed to maintain the maximum allowed 0.4 foot per second flow rate of water. The screen comes within inches of the bottom and side walls of the casting basin. For cycle two, the end sections of the power crowder will be modified to incorporate lessons learned from cycle one. The heavy neoprene material used to seal the end of the crowder against the sidewall of the basin was identified as being largely ineffective during cycle one. To make the power crowder more efficient and create a better seal between the power crowder and basin sidewall, Kiewit-General has re-designed the end connections of the power crowder to incorporate a sliding barrier that will have the ability to mechanically self adjust in the event that the power crowder slides further towards one side of the basin from the other. The neoprene seals originally added to the bottom of the power crowder will remain in place, however, Kiewit-General has modified the power crowder to include hanging steel chain located approximately six to twelve inches in front of the power crowder. to the addition of this chain or "tickler" will encourage the benthic fish species located in any deposited sediment on the casting basin floor to enter the water column in advance of the power crowder (Figure 6.2).

The structures for flooding the basin are immobile units located next to the casting basin gate. The sluice gates for flooding the basin are screened to prevent fish from entering the basin. Flooding and draining of the basin will occur passively, with the tides, but pumps will be used to fully drain the basin. The pumping system has been designed with proper fish screen flow rates, and will be monitored to ensure the maximum flow rate of 0.4 feet per second is not exceeded in accordance with NMFS guidelines (NMFS



1997). As previously mentioned, beginning with cycle two, once the 4-ft channel has been established, fish collection will progress from east to west. Changing the sequence of this operation to proceed from east to west will enable the fish handling team to clear and section off the area directly in front of the HCS pump house. Once the area immediately in front of the HCS pump house has been cleared, the easternmost portion of the power crowder will be removed and replaced with a barrier that angles NE, back toward the east basin wall at approximately 30 to 45 degrees.(Figure 6.3) The sluice gate area may also be used as a storage area for predatory fish. If predatory fish need to be segregated from smaller fish, they will be manually moved using a dip net from the casting basin to the sluice gate area (refer to Appendices C and D).

The casting basin gate structure sits on four bearing pads with 3 inches between the gate cross members and the floor. To eliminate fish hiding places, these 3-inch gaps will be eliminated by mounting a sponge material on the bottom of the cross members. Internal partitions will compartmentalize the casting basin gate, allowing Fish Herders to herd fish out of a particular section of the casting basin gate and then close it off. The foam partitions within the casting basin gate structure will help to better confine the fish so that the Fish Herders have fewer structural members to deal with at a time (refer to Section 7.0 and Appendix E).

The fish box is constructed of steel with removable end and top plates and will provide a stable holding area for the collected fish. If necessary, the water in the box will be cooled with ice. The box is equipped with oxygen canisters and air stones for aeration. The box is 7 feet 6 inches long by 4 feet wide and 4 feet high. The interior fish holding area is 6 feet by 4 feet containing approximately 450 gallons of water when filled to 30 inches. The box is equipped with integrated pick points so it can be picked by a crane (refer to Figures 6.4 and 6.5, and Appendix F).

7.0 Sequence of Activities: Basin Flooding, Pontoon Float Out, Draining, and Fish Handling

Prior to the second float out, Kiewit-General and WSDOT will conduct a dry run of the manual fish herding equipment, and a walk-through operation of the power crowder, fish herding, and the fish collection box transfer. Additionally all fences and barriers in the basin will be installed to ensure proper fit. As described later in this section, a series of screen panels will be added to the lowermost truss section for fish herding purposes. The entire length of the basin cannot be utilized for this dry run as the pontoons will be under construction and in the way. At the North (ramp) end of the basin there will be approximately 25 feet of space between the perimeter wall and the pontoons. This area will be utilized for the dry run. The power crowder will be assembled in the northernmost



end of the basin, and will be advanced to within 4 feet of the pontoons. The fish collection box will be installed on the west end between the pontoon and power crowder. The barriers, hand seines, and potentially a fixed screen wheel mounted manual crowder will be tested in the dry. Subsequently, there will be a dry run of the fish release with the collection box on the south west end of the basin. The collection box will be moved by crane out of the basin and into the adjacent waters of the launch channel adjacent to the floating dock where the fish release process will be tested. All operations will be repeated as necessary to fine tune the operation.

In the lessons learned meetings subsequent to cycle one float out, the initial basin seining was identified as an operation that could be improved. In efforts to make this operation more effective, Kiewit-General has had the large basin seine re-designed to better suit both the geometry of the basin, and the unique application of the seine net (refer to Appendix M). In preparation for fish handling, prior to float out, the exterior walls of the pontoons will be pressure washed. The basin will be cleaned of all construction debris and equipment, and then washed down with water. All wash water will be handled by the site process water system. Basin drains will be fitted with screens prior to flooding the basin to prevent fish entrainment. Foam will be installed between bays underneath the casting basin gate prior to flooding the basin (refer to Figure 7.1) to compartmentalize the gate structure.

To commence basin flooding, the sluice gates will be opened and water will enter. Water velocity will be monitored at the intake structure during this flooding to avoid exceeding allowable velocities across the face of the screen. Once the water level inside the basin matches the level outside the basin, the casting basin gate may be removed. If there is a significant delay between gate removal and pontoon float out, Kiewit-General will work with the WSDOT directing biologist to determine adaptive management measures that could be taken to reduce fish entry to the basin.

Immediately after the last pontoon has left the basin, the block net will be deployed across the face of the gate area preventing fish from entering the basin. A seine net will then be used to remove the majority of fish from the basin with the intention of reducing the number of fish to be handled. This net will span the width of the basin, and will be weighted to be close to the bottom of the basin floor (Refer to Appendix M). The seining operation will start at the ramp at the northernmost end of the basin. The seine net will be pulled through the basin southward. Once the seine net nears the gate area the block net will be picked up and positioned just out of the way of the passing seine net and then it will be reinstalled once the seine net has cleared the basin sill. The gate resetting operation will then begin with the block net in position to eliminate fish swimming into the basin. After gate setting is complete, and the water has been drawn



down to the working depth for fish handling, at or near the 30-inch mark, a series of screen panels will be added to the lowermost truss section. These steel screens will serve two primary functions; first, they will reduce the number of fish that are able to enter the gate area as the power crowder advances through the basin. Second, the screens will functionally create a uniform 4-ft herding channel for the collection and relocation portion of the operation.

Once the basin is dewatered to a level of 30 inches, the HCS pumps will be shut down and the fish crowding operation can begin.

At the north end of the basin, the fish will be manually herded down the ramp using pole seine nets to clear fish from the location the power crowder will be initially installed. The power crowder will then be installed at the back of the basin in multiple sections. This activity will ensure that fish are not trapped behind the power crowder.

The power crowder will begin at the north end, or ramp end, of the casting basin and will be moved to the south end, or the gated end, of the casting basin. The power crowder will be advanced through the basin with air winches (refer to Section 4.0). The winches will be attached to anchor blocks set at the south end of the basin in front of the gate and bulkhead wall. The crowder will be advanced through the basin until it reaches the established area near the bulkhead wall, creating a 4-ft channel for fish collection and relocation. The blocks will then be picked with the tower crane and flown out of the handling channel so that the fish handling operation can begin. Should the primary means of advancing the power crowder fail Kiewit-General will have forklifts or loaders available that can be used to push the power crowder through the basin. The power crowder will be outfitted with appropriate attachments so that it can be moved with a forklift or loader (refer to Figures 7.2 and 7.3). If a forklift, loader, or any other piece of heavy equipment is used in the basin to advance power crowder, it will first be thoroughly inspected and cleaned immediately prior to use for water quality and spill control considerations. Any sheen on the water surface resulting from the use of heavy equipment within the casting basin will be a trigger for adaptive management aimed at avoiding exposures that could result in take, or could result in a discharge violating water quality standards pursuant to Ecology requirements.

Implementing lessons learned from cycle one, the barrier screens in front of the casting basin gate have been re-designed and will be set in place prior to crowder advancement through the basin. Setting the barrier screens prior to crowding fish will minimize the opportunity for fish to enter the gate truss area. In efforts to expedite the fish capture and release from within the gate area, custom fykes are being fabricated to fit in each



bay (Figure 7.4). Each one of the fykes will have a detachable collection box that can be exchanged for an empty box at the discretion of the fish handling team.

Once the power crowder is within 4 feet of the casting basin gate, fish will be manually herded out of the fish box area using pole seines, and a barricade fence will be installed. The fish box will be lowered into the basin by crane and the areas between the fish box and the fence and power crowder will be sealed off to ensure that fish do not get trapped behind the box. The end plates of the box will be removed, and if necessary the top plates as well. Prior to starting manual fish handling, Fish Monitors and the WSDOT Directing Biologist will approximate the abundance of fish present to determine the number of fish box transfers that are expected. Several passes may be required to limit the number of fish in the box. For example, the first pass may start at the center of the basin, effectively herding only half of the basin width into the box (Figure 7.5). Fish will be herded from east to west of the casting basin towards the fish box using pole seines, or a perforated plate mounted to a rolling assembly that will fit snugly into the 4-ft channel. At the direction of the WSDOT Directing Biologist, the team will determine the appropriate number of fish to be placed in the box at one time. The Fish Monitors and WSDOT Directing Biologist will monitor for dead and injured fish and Kiewit-General's Fish Herders will remove them from the casting basin or fish box with a dip net, as needed, to ensure that they are properly documented and not accidentally released into the launch channel.

Once the appropriate number of fish are in the box, the box will be closed and a temporary barricade fence will be placed in front of the fish box. The box will then be flown out of the basin, over the bulkhead wall, and lowered to allow fish release into the holding pens attached to the floating dock (Grays Harbor, directly in front of the casting basin adjacent to the temporary float). The end plate will slowly be lifted to allow the fish to exit into the holding pens. If all fish do not voluntarily leave the box, the box will be fitted with rigging to allow the box to be tipped on end and a pole net could be placed into the fish box to encourage their egress. Once all the fish have exited the box, it will be flown back into the basin, if required for additional fish removal. A Kiewit-General employee will be in a skiff outside the casting basin to coordinate and witness release of the fish. A WSDOT fish monitor(s) will be on the floating dock adjacent to the point of release. Revisions to the fish handling operation for cycle two include compartmentalization of the 4-ft channel between the power crowder and the gate. (Figure 7.6) Compartmentalizing the 4-ft channel will create a sequential operation and enable the fish handlers to completely close off areas after the fish have been removed. The first area to be cleared will be the area immediately in front of the HCS pump house. This will allow for disassembly of the easternmost end of the power crowder, and installation of an angled section of barrier. The second area to be cleared will be the



area between the HCS pump house and the east jamb, in front of the sluice gates. This area will subsequently be fenced off to act as a holding area for predatory fish. Fish monitors will identify predatory fish and Fish Herders will move these fish into this holding area with nets as practicable. Any predatory fish placed in this area will be removed via the fish box after all other fish are removed from the casting basin.

Another addition to the fish handling operation for cycle two is a custom fabricated fyke designed to catch any fish that evaded the power crowder and are following the volition of the water toward the HCS pump house. This newly added angled screen and fyke have been strategically designed to work in tandem, advantageously using the flow of water to encourage fish down the length of the screen and into the fyke. (Figure 7.7) Similar to the fykes previously described for use in the gate area, this fyke will have a detachable collection box that can be exchanged for an empty box at the discretion of the fish handling team.

After the fish capture reaches diminished return, all partitions will be removed and the power crowder will be disassembled and flown from the basin with the aid of the tower crane.

During final basin dewatering, the discharge velocity will be carefully monitored to prevent any fish that may still be in the basin from getting caught against the HCS screen. If the velocity is measured to be too high, one or more pumps may be shut down. During final basin draining, a group of fish handlers will make a sweep of the basin searching for any fish that are still alive and capable of survival. This final sweep shall be coordinated by the WSDOT Directing Biologist in conjunction with the Kiewit-General General Superintendent, and any remaining fish will be manually removed from the basin with dip nets and buckets.

8.0 Fish Monitoring

8.1 Requirements

The identification and enumeration of fish is a requirement for several permits and approvals (i.e., Hydraulic Project Approval and ESA requirements). This Fish Handling Plan prioritizes the minimization of fish handling stress over species identification and enumeration. Every effort will be made to identify and count fish as they are transferred; however due to water quality and the nature of the fish-handling operation, Fish Monitors will record and report species identification and approximate counts to the extent possible. Fish monitors will identify and count fish, note injuries or mortalities, and note location of release during flooding of the casting basin and pontoon float outs.



Fish monitors and herders will watch for fish jumping over the power crowder during operation and retrieve them during basin drainage. Fish species that may be encountered during the pontoon float out cycles and fish handling activities are listed in Appendix G. A description of the timing of salmonid occurrence in Grays Harbor and a fish migration window chart are included in Appendix H that indicates when juvenile fish should be expected.

Because minimizing fish handling is the primary goal of the various permits and approvals, visual observation is the preferred method to identify and enumerate fish.

Based on lessons learned during cycle one, changes will be made to facilitate fish enumeration, and evaluate fish injury, recovery, and mortality. Specifically, a fish release holding pen will be placed next to the temporary floating dock in the launch channel to facilitate this process. As described above, fish being removed from the basin in the fish box will be flown (by crane) out of the basin and released into the holding pen. The holding pen will consist of netting around a rigid frame and allow for fish observation, identification, and enumeration. The holding pen will allow fish to volitionally leave the pen if healthy, while injured or dead fish will remain inside the pen. Injured fish will be monitored until they have sufficiently recovered to be able to leave the pen on their own or expire. If injured fish die, they will be enumerated and the likely cause of death will be determined. Identification of species and accurate counting may not be possible due to the typically high turbidity/low visibility water conditions in Grays Harbor and difficulties inherent in accurately counting fish without handling them. During fish handling operations, approximately 30 inches of water will be maintained in the casting basin and fish handling box. If water clarity is not sufficient to accurately identify and enumerate fish, then estimates will be made based on the best professional judgment of the WSDOT Directing Biologist.

If fish must be physically handled, they will be handled according to WSDOT's fish handling protocols (WSDOT 2009). In summary, these protocols include the following:

- Fish handling shall be kept to the minimum necessary.
- Fish listed under the ESA shall not be held in containers for more than 10 minutes, unless those containers are dark-colored, lidded, and fitted with a portable aerator.
- Fish shall not be sampled or anesthetized.
- Ensure that water quality conditions are adequate in the containers used to hold and transfer captured fish (e.g., clean, cold, well-oxygenated water).



- Large fish will be kept in separate containers from small fish to avoid predation.
- Any dead ESA-listed species shall be kept whole and preserved on ice or frozen until WSDOT receives a response and further directions from the appropriate authority.
- All fish nets will be composed of a soft, non-abrasive nylon material less than 9.5mm stretched.
- Fish handlers and monitors will insure that their hands are free of harmful and deleterious products such as sunscreen, lotion, and insect repellants.

When fish must be physically handled, the following additional data will be collected opportunistically:

- Species estimated age/class (e.g., fry, juvenile, adult)
- Size (total length or fork length)
- Condition at release
- Location of release

These data will not be collected if collecting the data will result in additional handling or harm to the fish.

Additionally, fish monitoring will include procedures as described the Casting Basin Water Data Collection Plan (Appendix L). This plan is focused on monitoring water quality within the casting basin immediately after the float-out of the pontoons, with an emphasis on how it may change in different parts of the casting basin during and after specific fish removal activities. The monitored parameters will be TSS, DO, and temperature. These data will inform whether the TSS or DO levels may be harming fish, and allow the WSDOT Directing Biologist to implement adaptive management in order to protect more fish. A copy of the plan is attached in Appendix L.

8.2 Equipment

This section describes the equipment necessary to conduct the fish monitoring. Under no conditions will electrofishing occur. For visual identification and enumeration activities, the following equipment will be needed:

- Plexiglas-bottomed buckets, snorkeling equipment, or polarized glasses
- Fish identification keys
- Appropriate clothing (e.g., hip waders or boots, rain gear, waterproof gloves)



- Pencils and indelible pens
- Notebook or data sheets to document monitoring activity and results

For fish handling and additional data collection, the following equipment will be needed:

- Plexiglas-bottomed buckets, snorkeling equipment, polarized glasses to observe fish
- Appropriate clothing (e.g., hip waders or boots, rain gear, neoprene gloves)
- Fish identification keys
- 5-gallon bucket(s) with air stones
- Aquarium dip net(s)
- Scale
- Fish measuring boards
- Coolers with blue ice or equivalent
- Aluminum foil to wrap fish
- Resealable plastic bags (to place wrapped fish in)
- Pencils, pens
- Notebook or data sheets to document monitoring activity and results

Any ESA-listed fish incidentally killed as a result of fish capture and removal operations will be kept whole, preserved on ice or frozen, and delivered to the appropriate authority upon request (refer to Section 9.0, below).

8.3 Documentation

The Fish Monitors will document their activities and data collected into a field notebook, log book, or on field forms. The Fish Monitor will provide a copy of the notebook, log book, or field forms to Kiewit-General, as Kiewit-General is responsible for managing and keeping the documentation for the SR 520 Pontoon Construction Project. WSDOT will submit the documentation to WDFW, NMFS, and the USFWS. The following information will be documented, regardless of activity (visual identification or fish handling):

- Project location
- Date
- Methods
- Personnel



- Water quality data (temperature, visibility, and conductivity)
- Fish species
- Number of each species
- Relative condition at release
- Location of release
- Any distressed fish observed
- Any fish mortality that occurred

Again, Kiewit-General is responsible for this documentation, but the Fish Monitors (WSDOT) will provide Kiewit-General with the information.

9.0 Notifications

Kiewit-General will work with WSDOT to make the proper notifications at the beginning of each float-out cycle and in the event of sick, injured, or dead fish resulting from project activities. At least 5 days prior to the float-out cycles and fish handling activities, Kiewit-General will notify WSDOT who will in turn notify the WDFW District Fish Biologist.

In the event that distressed fish, a fish kill, or water quality problems (including equipment leaks or spills) are observed during fish handling activities for non-ESA-listed species, Kiewit-General will immediately notify WSDOT, who will notify the applicable agencies (including WDFW and/or the Washington Military Department Emergency Management Division; refer to Table 2, below).

Notifications will be made to USFWS, NMFS, and WDFW if sick, injured, or dead ESA-listed fish are found. WSDOT will also notify USFWS or NMFS if the limits on take of ESA-listed species are exceeded (harm or harassment), or if incidental take is approaching and may exceed specified limits (Table 2). Kiewit-General will work with the Fish Monitors to ensure that sick fish are handled with care.

Table 2. Fish Handling Notifications

| Notification | Agency | Name/Title/Phone/Email |
|---|--|------------------------------|
| Pre-activity notification | WDFW | District Fish Biologist; TBD |
| Distressed fish, fish kill, or water quality problems— <i>non ESA-listed fish</i> | WA Military Departments' Emergency Management Division | (800) 258-5990 |



| Notification | Agency | Name/Title/Phone/Email |
|---|--|---|
| | WDFW Ecology | Amy Spoon, Area Habitat Biologist; (360) 249-1228 Amy.Spoon@dfw.wa.gov Kerry Carroll, Federal Project Manager; (360) 407-7503 Kstr461@ecy.wa.gov |
| Notice of sick, injured or dead fish— <i>ESA- listed</i> | USFWS Washington Fish and Wildlife Office, Attn: Transportation Planning Branch | Ryan McReynolds; (360) 753-9440 |
| | NMFS Law Enforcement | (206) 526-6133 or (800) 853-1964 |
| | WDFW | (360) 249-4628 |
| | WA State Habitat Office | (360) 753-9530 |

Note: This notifications table is also included in Appendix K for quick access in the field.

If an ESA-listed fish is incidentally killed during the fish handling activities, it will be documented and WSDOT will provide notification to the appropriate authority within 2 working days, or required timeframe of applicable permits. The initial notification will be made with a phone call or voice mail message to USFWS, WDFW, NMFS, Ecology, and the Washington State Habitat Office at the phone numbers included in Table 2.

In accordance with the WSDOT Fish Exclusion Protocols and Standards, dead fish/specimens killed during fish handling activities will be kept whole and preserved on ice until WSDOT receives a response or directions from the appropriate authority (WSDOT 2009). After 5 working days, the WSDOT Directing Biologist will direct Kiewit-General to dispose of the specimens if they have not heard from the appropriate authority. The initial phone notification will be followed up with a second notification in writing that includes the date, time, the WSDOT Directing Biologist name and contact information, project number, NMFS and UWFWS tracking numbers (USFWS reference # 13410-2010-F-0491 and NMFS tracking # 2010/03543), location of killed, injured, and unrecovered fish, number of specimens and species, and cause of death. The written notification will also include an explanation of the circumstances causing the observed levels of take, if necessary.



Kiewit-General recognizes that if the amount of take of ESA-listed species exceeds the allowance (1 bull trout harmed, 3 bull trout harassed, 12 adult sturgeon, and 12 adult eulachon), work would stop and the ESA consultation would need to be re-initiated.

10.0 Reporting

Reporting on the fish handling activities will be a joint effort between WSDOT and Kiewit-General. The WSDOT Fish Monitors will prepare a report that will be included in the Kiewit General float-out cycle report that will be prepared for each float-out cycle. Kiewit-General will be responsible for developing and submitting the required reports that are described in greater detail below in Sections 10.1 and 10.2.

10.1 Casting Basin Operator Report

Kiewit-General will document all flooding and float-out details including timing, duration, sequence, and any deviations from the Fish Handling Plan for each of the float-out cycles. Kiewit-General will maintain a log book during the float-out activities to document fish handling including: project location (county, water body, and lat/long or GPS coordinates), date, methods, personnel, water temperature, conductivity, visibility, and other comments (Appendix I). A FINAL fish handling monitoring report documenting each casting basin flooding and pontoon float-out event and associated fish handling will be submitted to USFWS, NMFS, and WDFW within 30 days of the fish handling activities associated with each pontoon production cycle. The float-out report will include a report prepared by the WSDOT Fish Monitors, as discussed in Section 10.2 below.

A final report will be submitted to WDFW upon completion of the Project. Interim reports may be submitted as requested. Kiewit-General will work with WSDOT to maintain accurate records indicating the fish species identified and counted during fish handling activities, fish that were either possessed or disposed of, the location of the collection, disposition of the fish, and the date of collection.

Kiewit-General will prepare and WSDOT will submit an In-water Construction Monitoring Report (Appendix J) to NMFS within 30 days of each float-out cycle that documents entrapment or take of green sturgeon and eulachon. Reporting of sick, injured, or dead ESA-listed species, or if the allowed take of ESA-listed species is exceeded, will follow the procedures discussed in Section 9.0. Kiewit-General will also document and prepare a report of all bull trout encountered during each float-out cycle and submit the report to WSDOT to submit to USFWS within 30 days of each float-out event. Notification and reporting requirements and contact information is included in Appendix K.



10.2 Biologist Reporting

The WSDOT Directing Biologist will prepare a summary report of the fish observed, handled, or captured as part of the FINAL fish handling monitoring report that will be prepared for each casting basin flooding and pontoon float-out event (refer to Section 10.1, above). The summary report will include the following information:

- Summary of fish encountered during fish capture and handling, specifically including
 - Green sturgeon and eulachon.
 - Bull trout.
- Records of the date of collection, fish species (to the lowest taxonomic level possible), number, age/size class estimate, condition at release, release location(s), and any disposition or specimens. Information should be recorded for all classified and unclassified species encountered or impacted by the float-out cycles.

Additionally, the Fish Monitors will follow the appropriate reporting and notification procedures outlined in Section 9.0, above.

11.0 References

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Simenstad, C. A. and D. M. Eggers. 1981. *Juvenile Salmonid and Baitfish Distribution, Abundance, and Prey Resources in Selected Areas of Grays Harbor, Washington*. Prepared by Fisheries Research Institute for U.S. Army Corps of Engineers. FRI-UW-8116. University of Washington, Seattle. September.

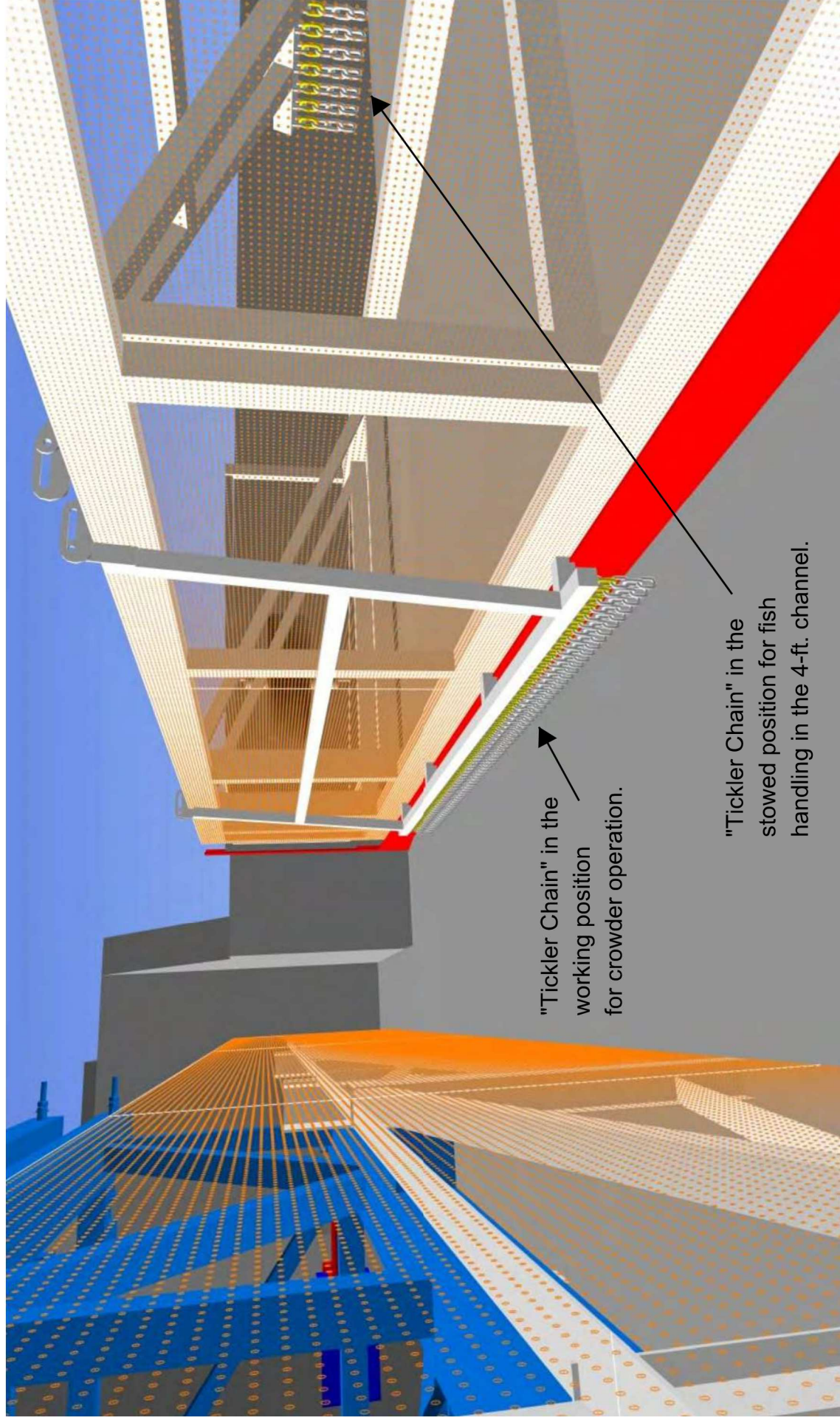
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0497. State Route 520 Pontoon Construction Project, Grays Harbor and King Counties, Washington. 6 December.

Washington State Department of Transportation (WSDOT). 2009. *WSDOT Fish Exclusion Protocols and Standards*. 25 June.

Figures



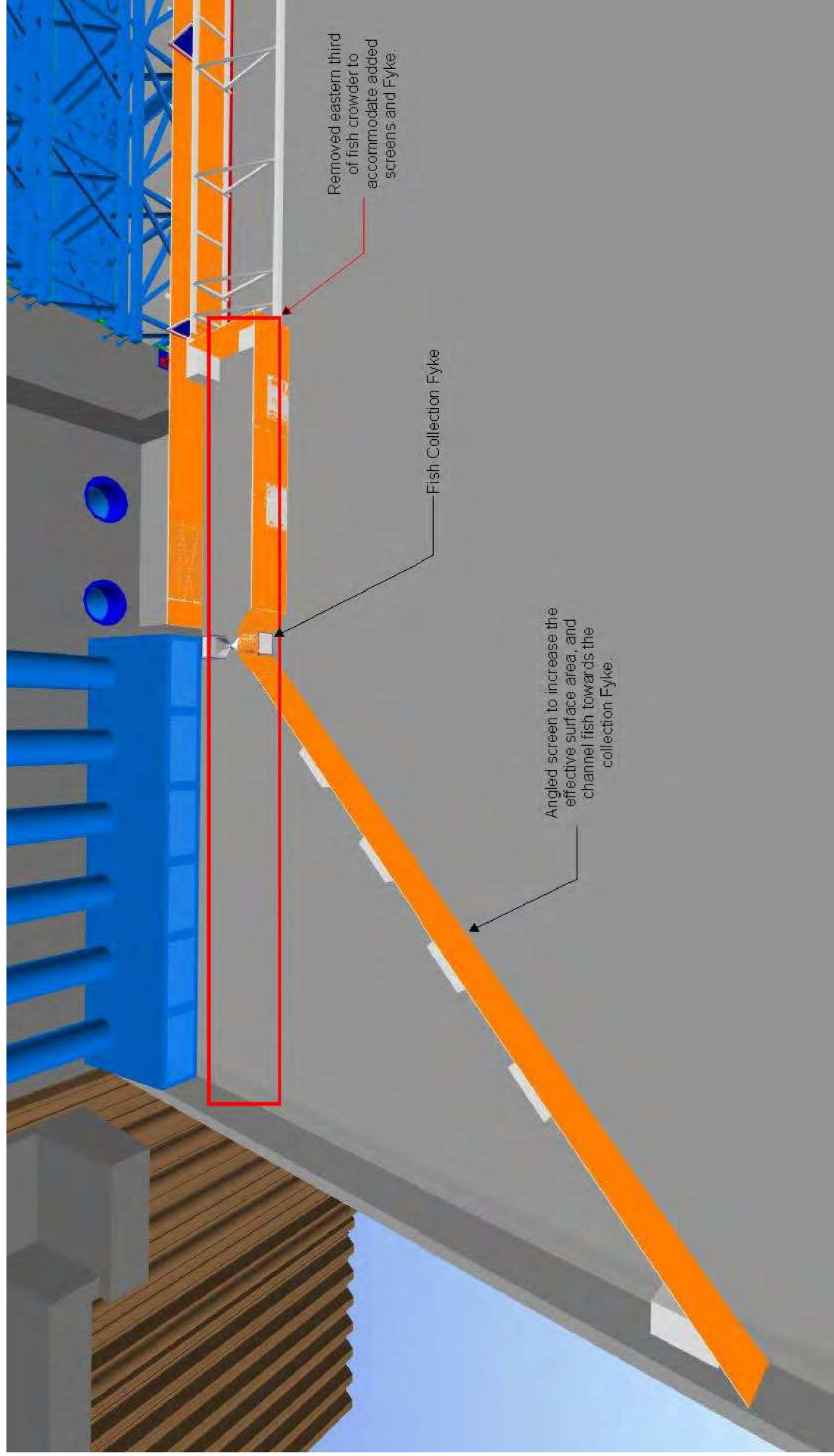
"Tickler Chain" in the working position for crowder operation.

"Tickler Chain" in the stowed position for fish handling in the 4-ft. channel.



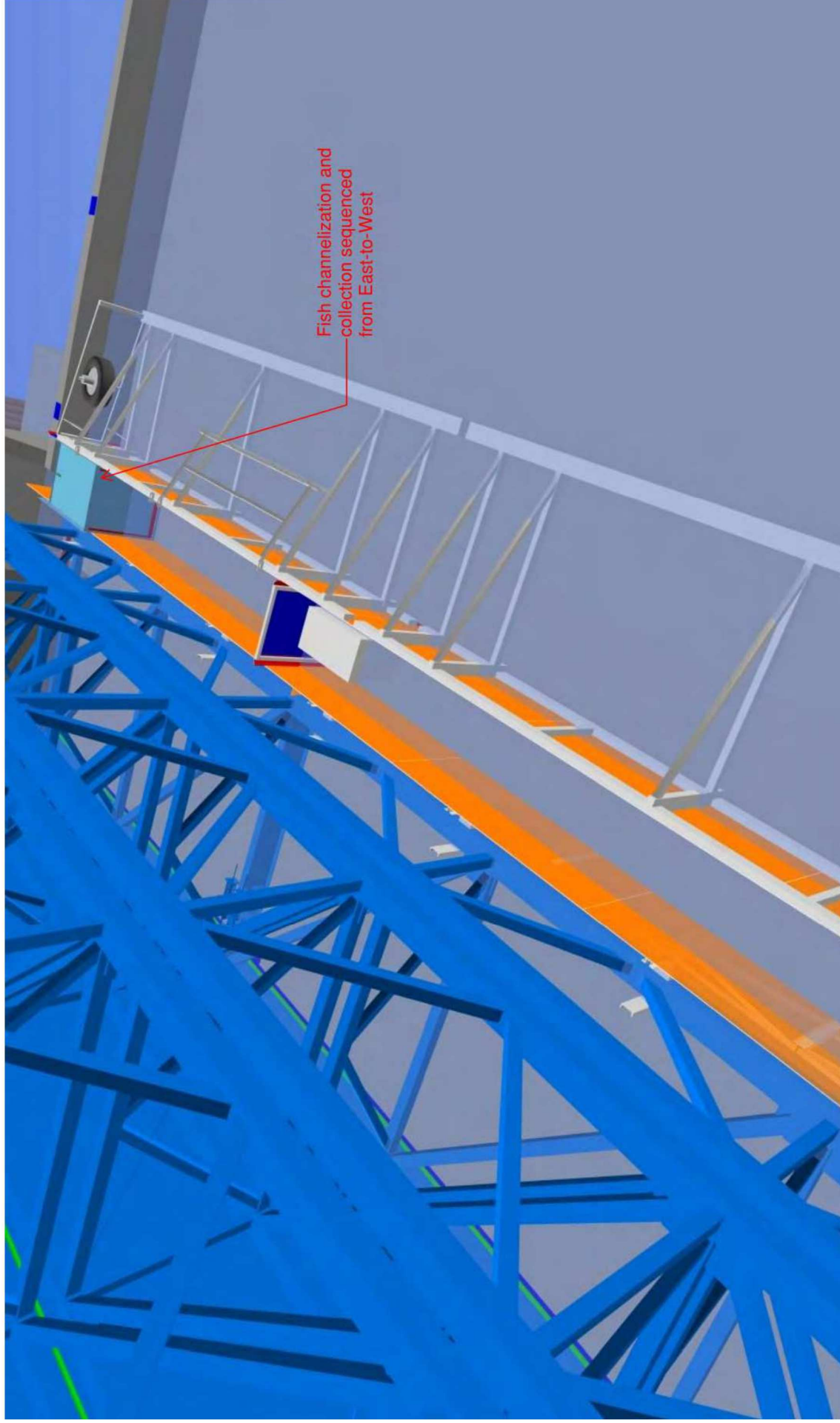
**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

**Figure 6.2
Power Crowder "Tickler Chain"**



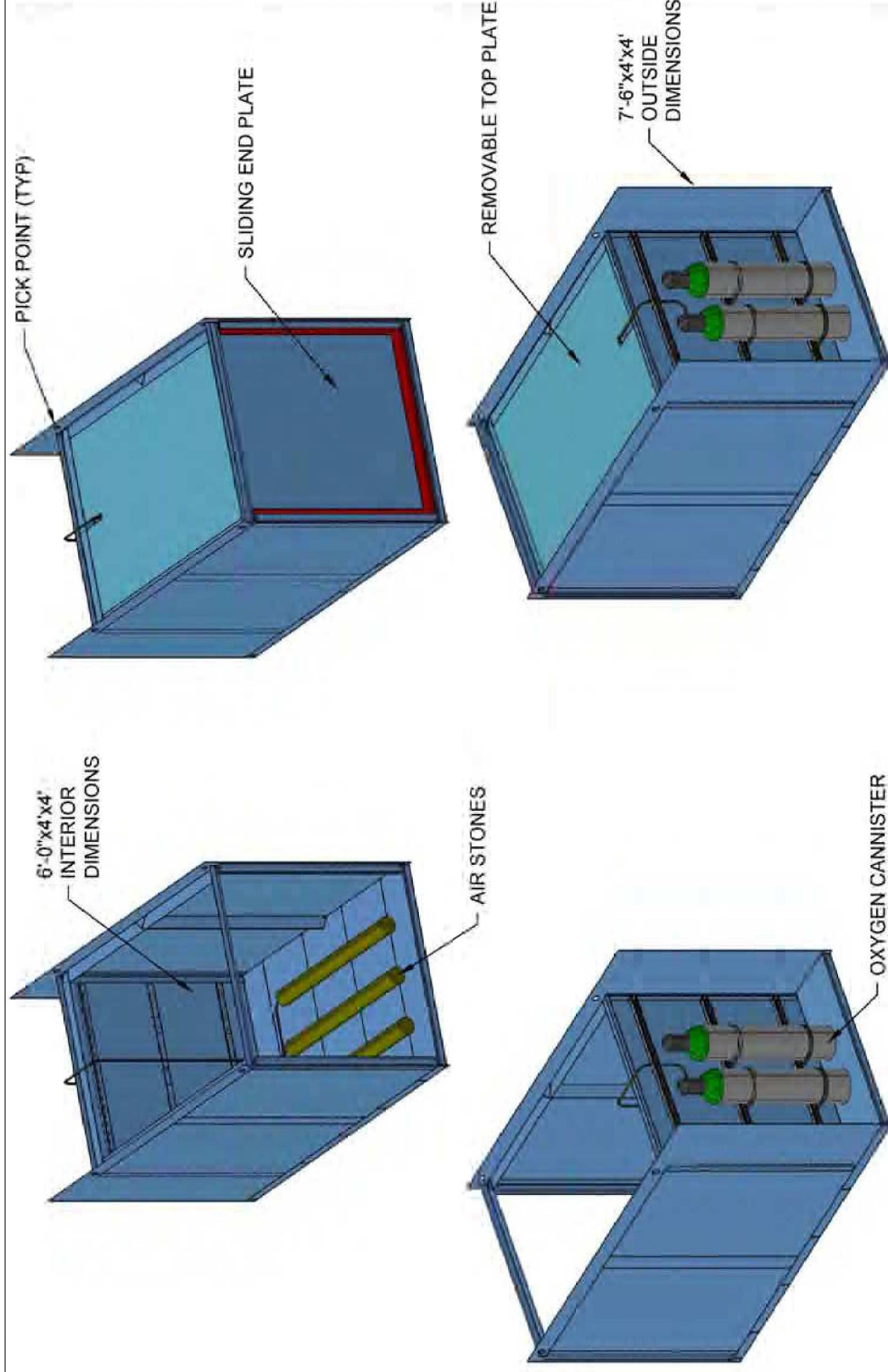
**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

**Figure 6.3
Angled Screens at HCS Pump House**



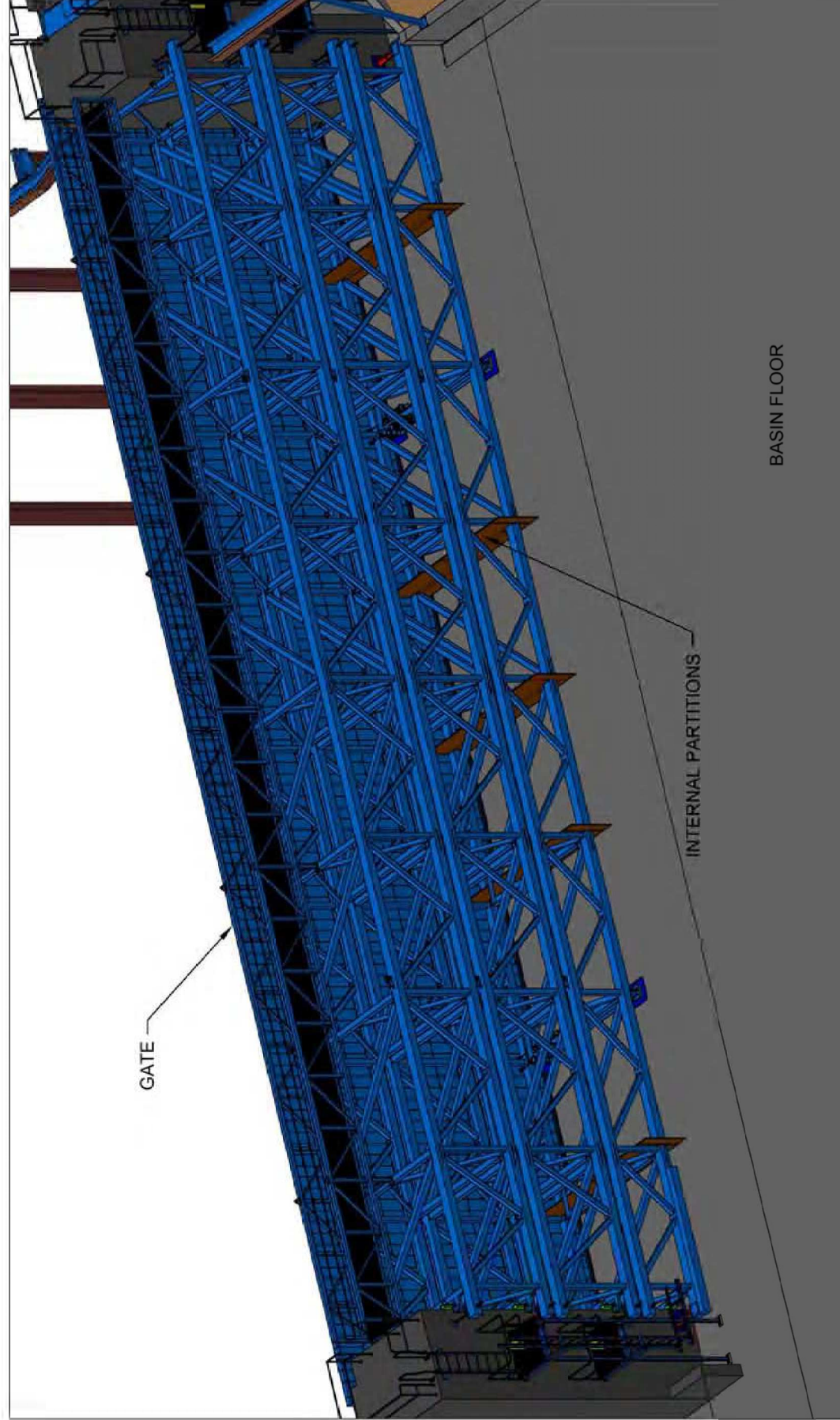
**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

**Figure 6.4
Power Crowder Advanced to Gate**



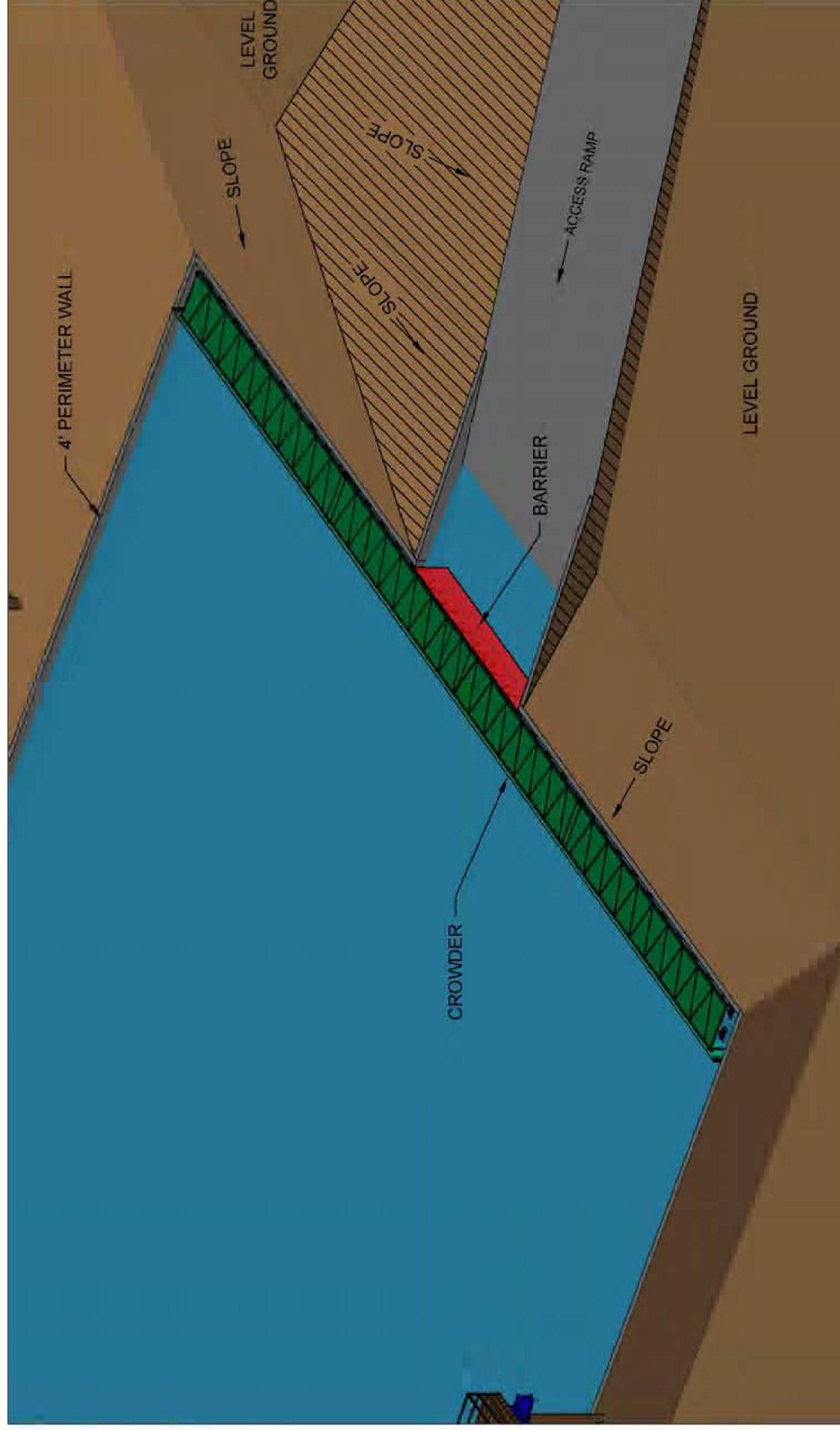
**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

**Figure 6.5
Fish Box Details**



**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

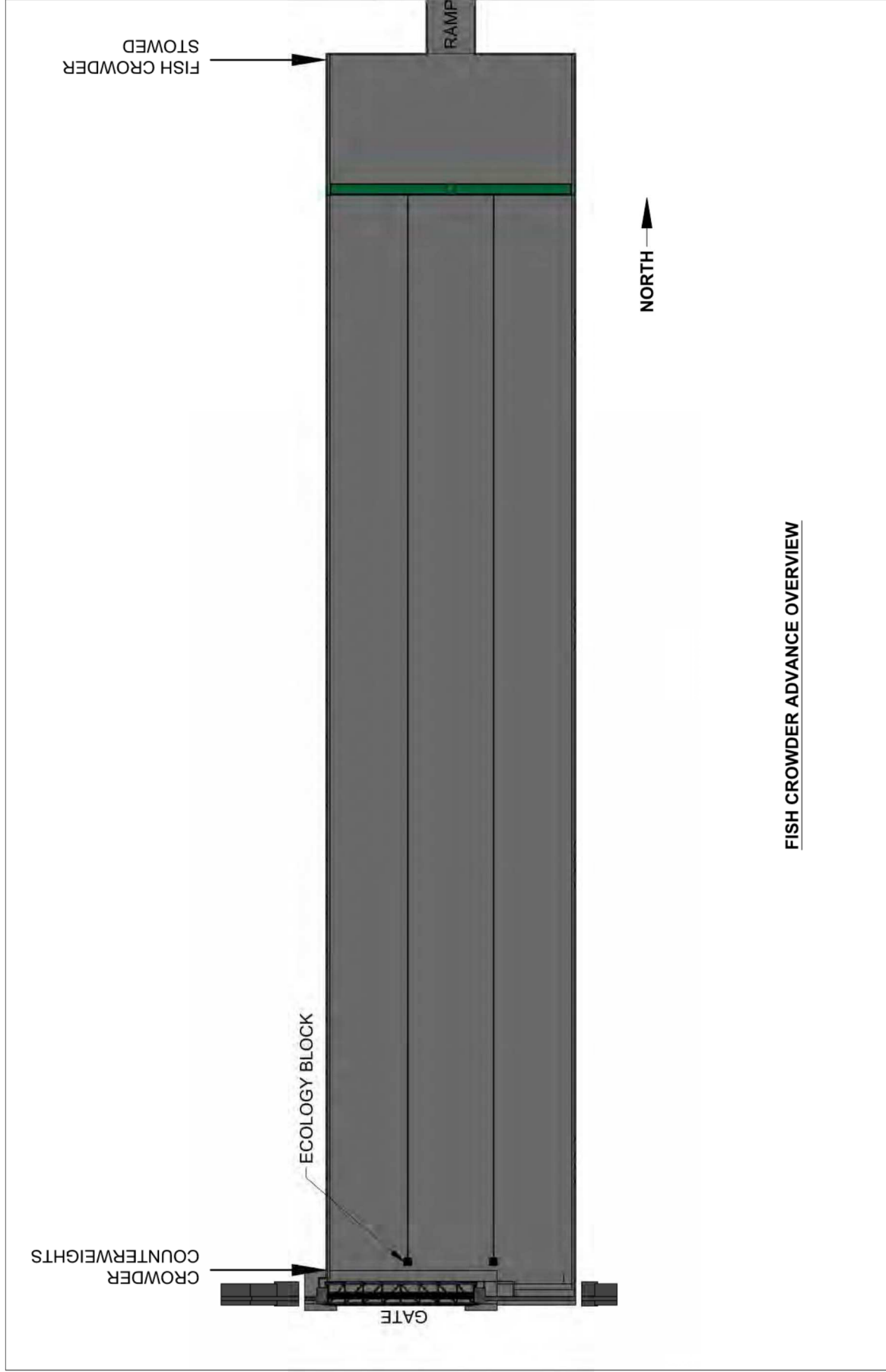
**Figure 7.1
Internal Partitions on Gate Structure**



**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

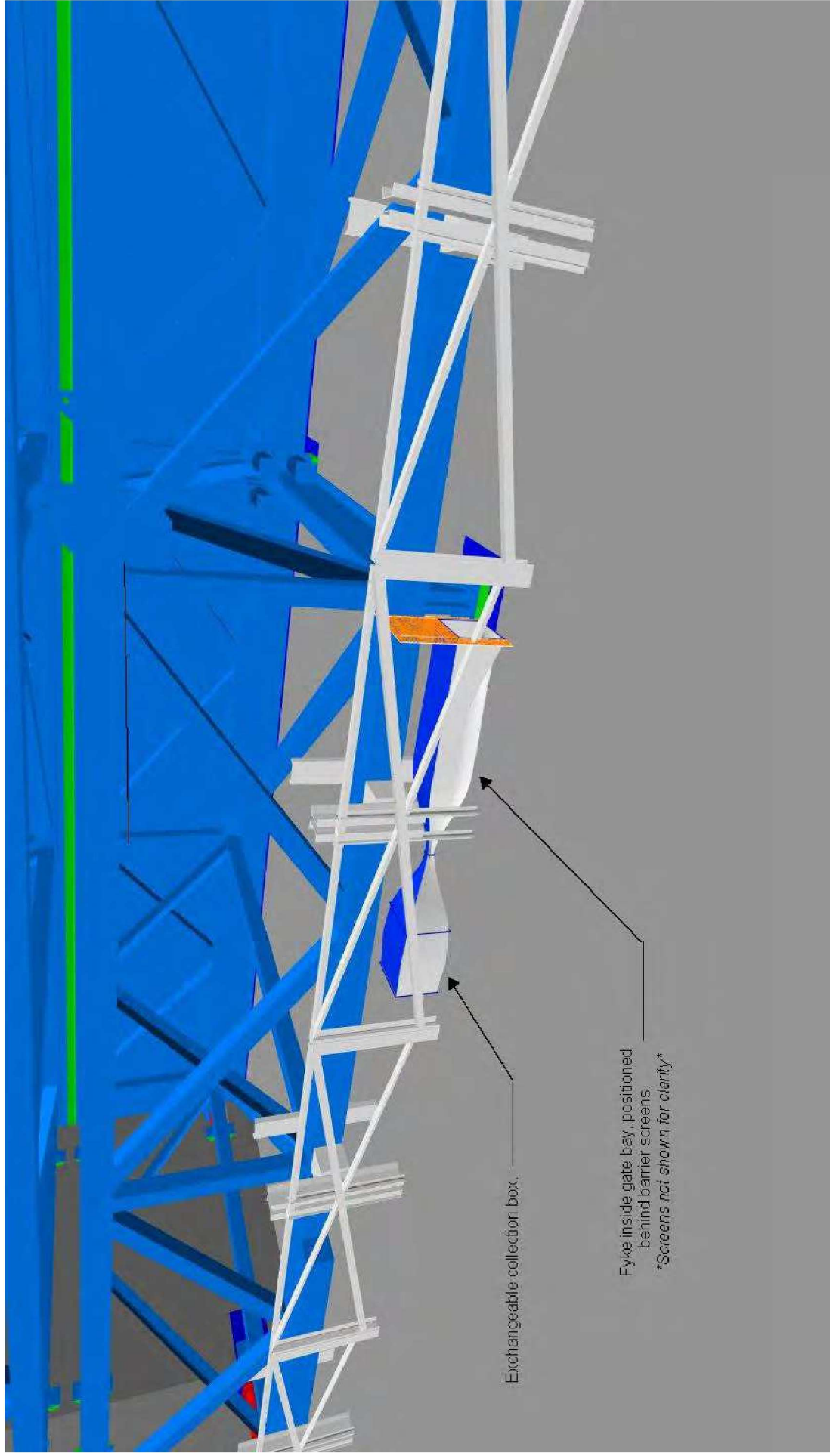


**Figure 7.2
Power Crowder Installation**



**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

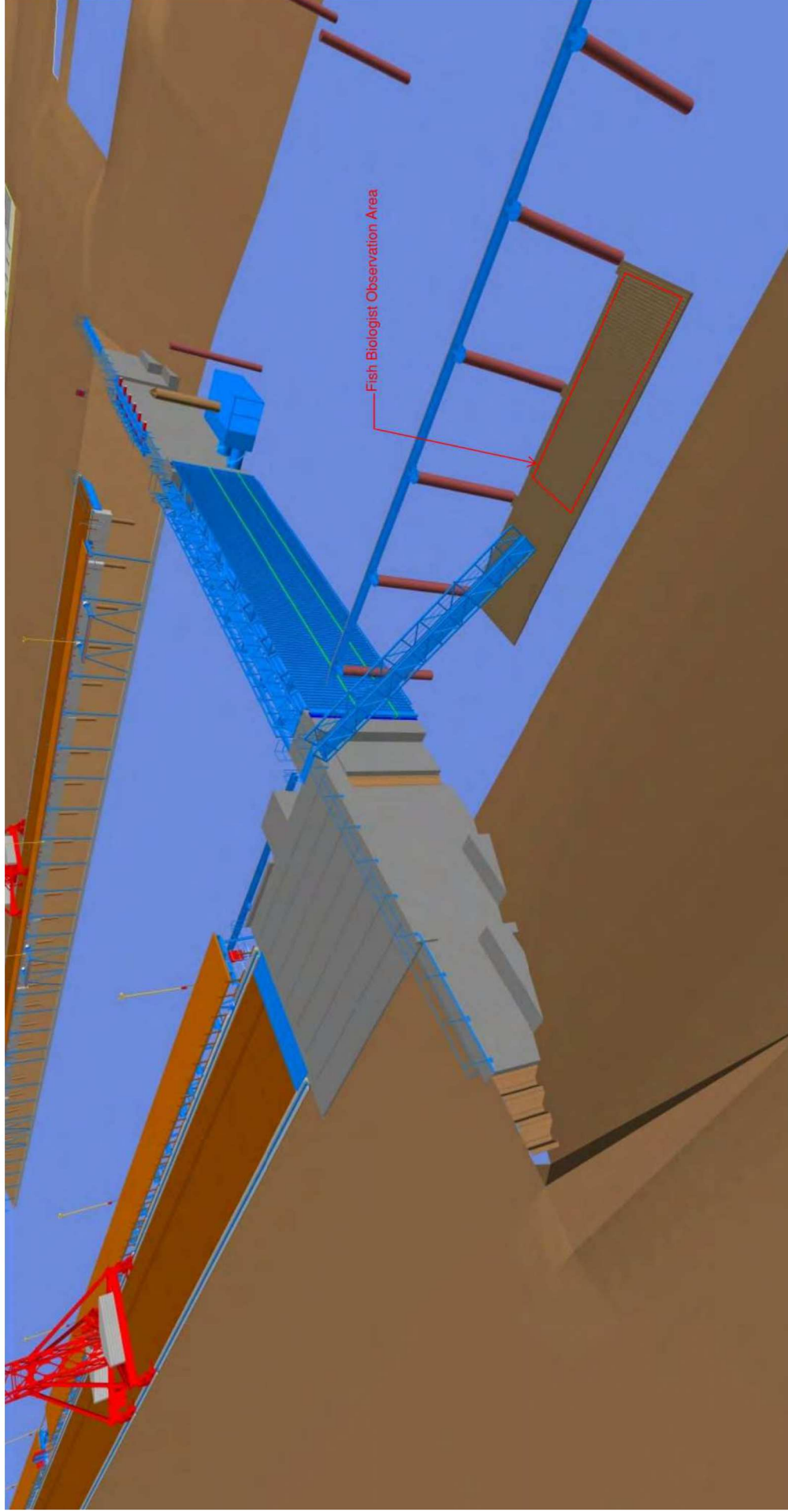
**Figure 7.3
Power Crowder Advancement Overview**



**Fish Handling Plan
 SR 520 Pontoon Construction
 Design-Build Project
 Aberdeen, Washington**

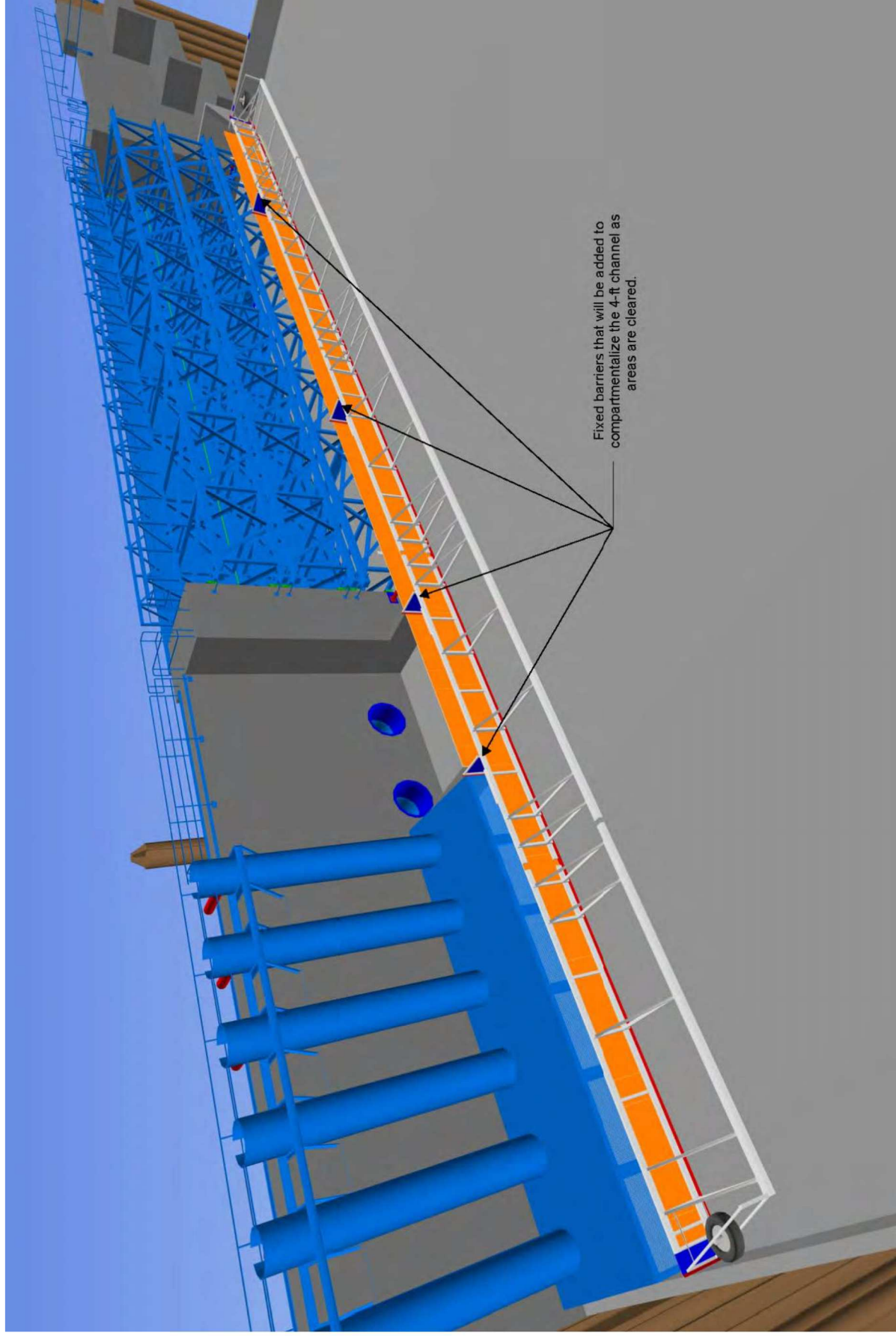
**Figure 7.4
 Collection Fyke Inside Basin Gate**





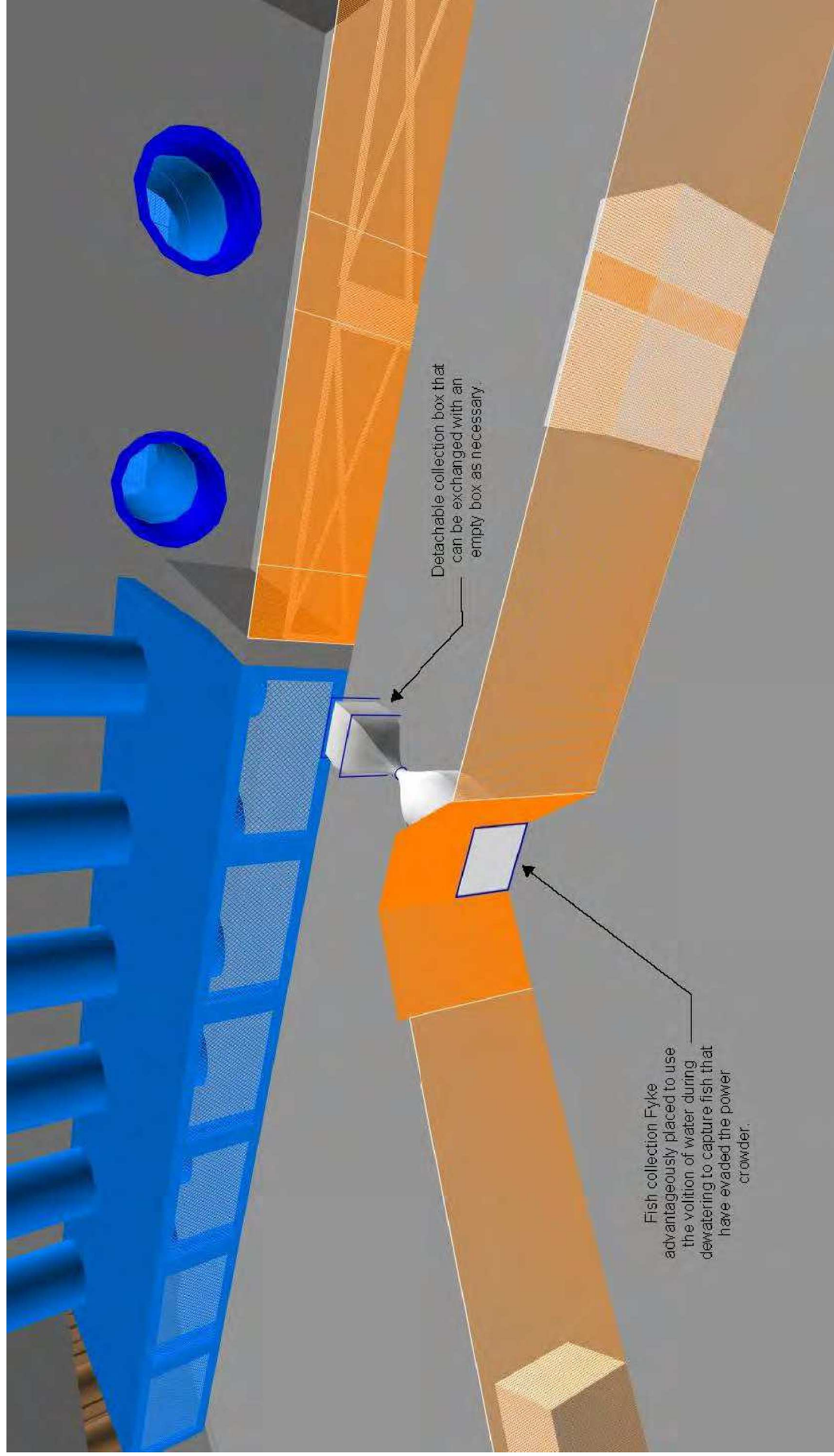
**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

**Figure 7.5
Fish Box Installed in Basin**



**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

**Figure 7.6
Compartmentalization of Fish Handling
Channel**

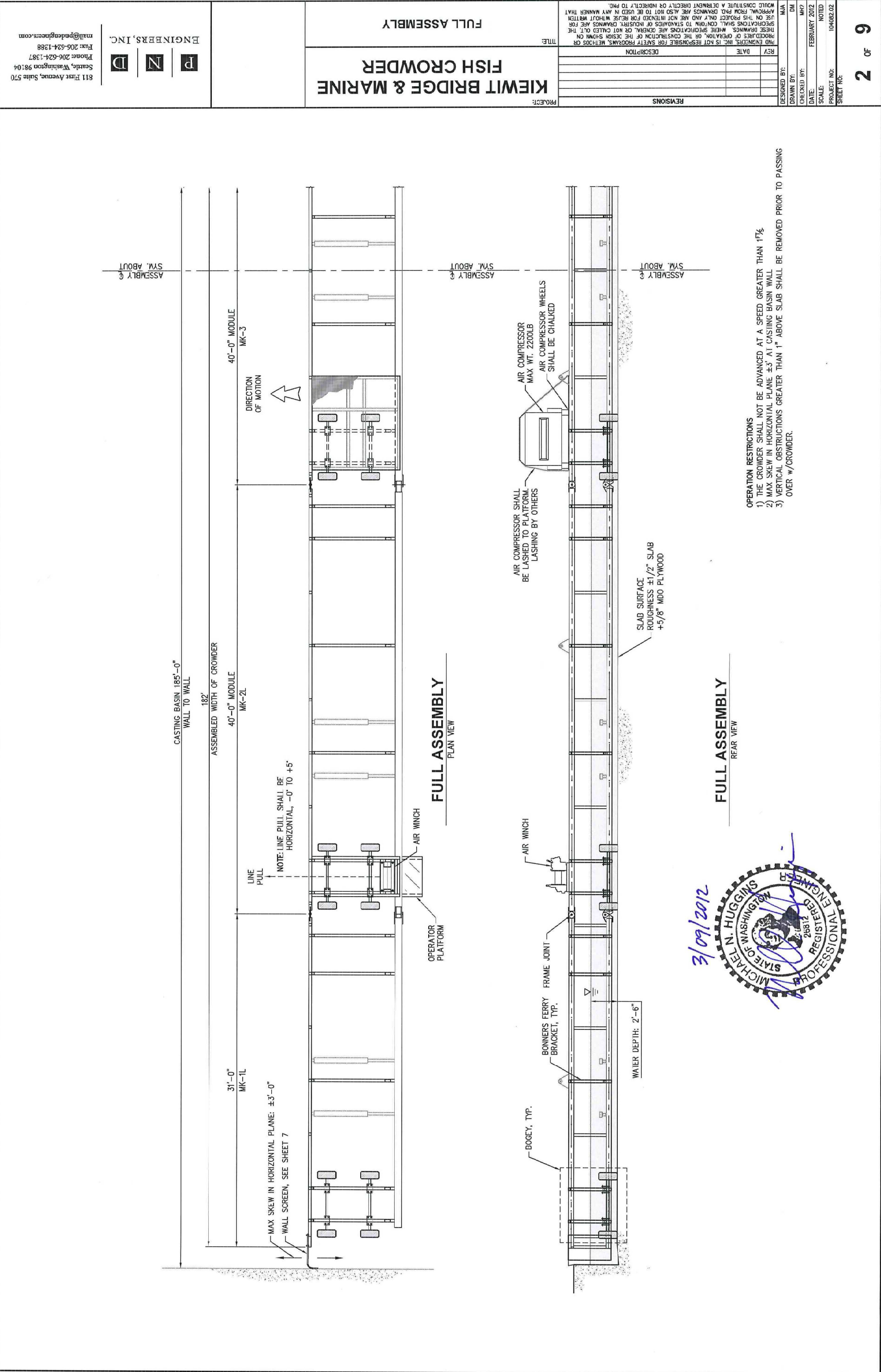


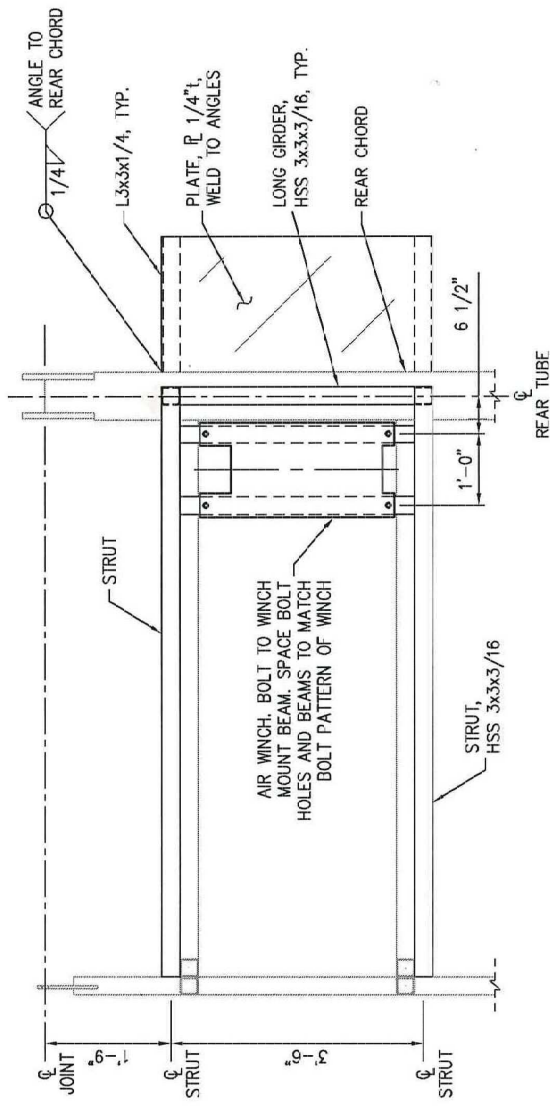
**Fish Handling Plan
SR 520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

**Figure 7.7
Collection Fyke at Angled Screen**

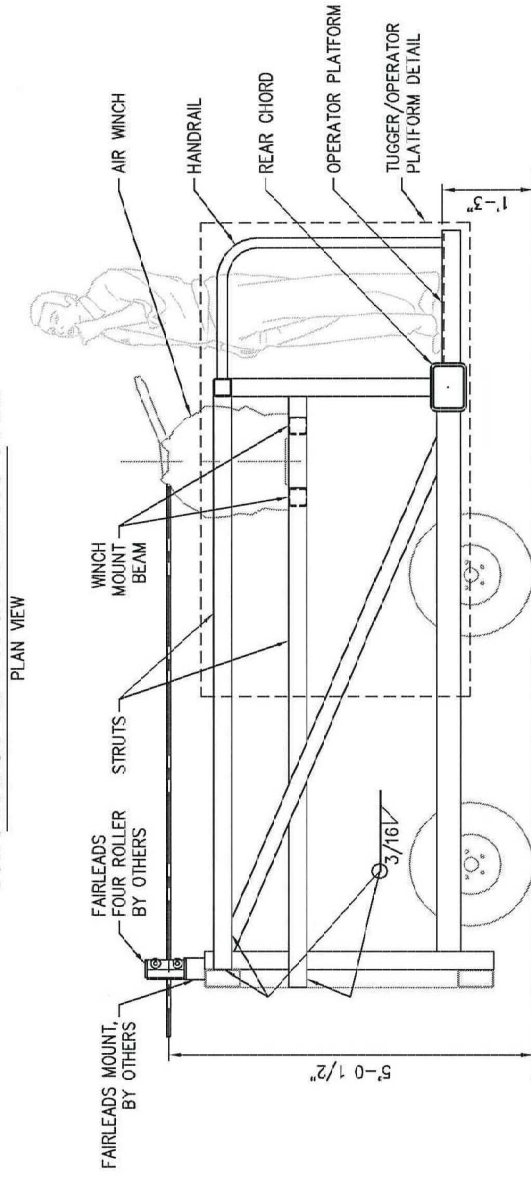
Appendix B

**Power Crowder As-Built Drawings
(Provided on CD-ROM upon Request)**

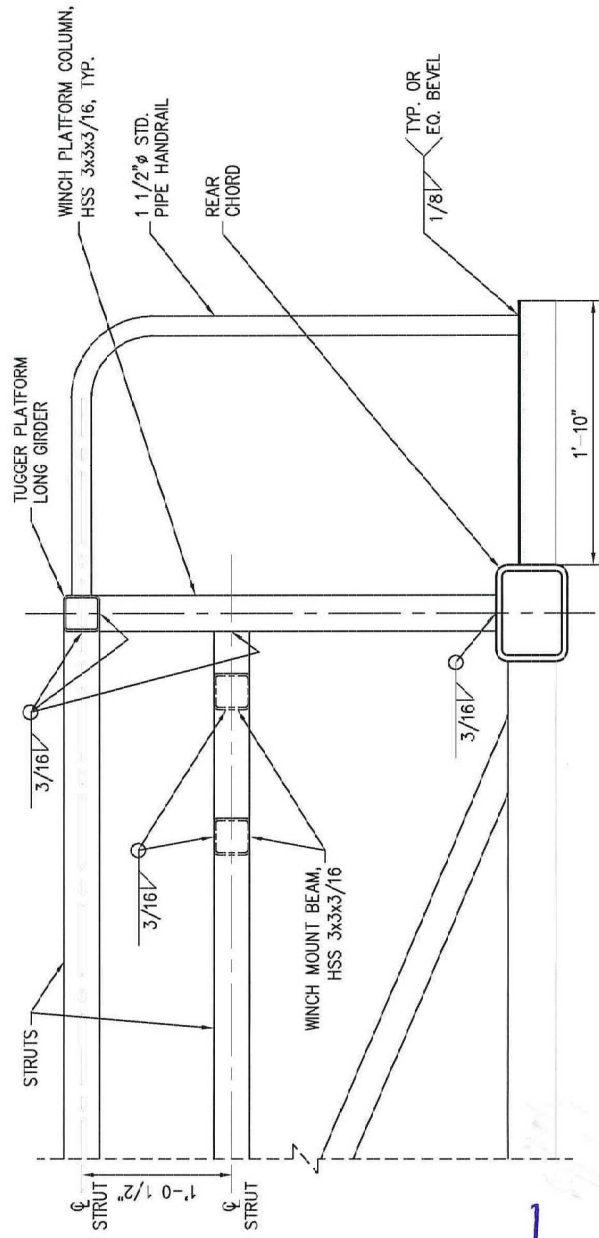


[illegible]

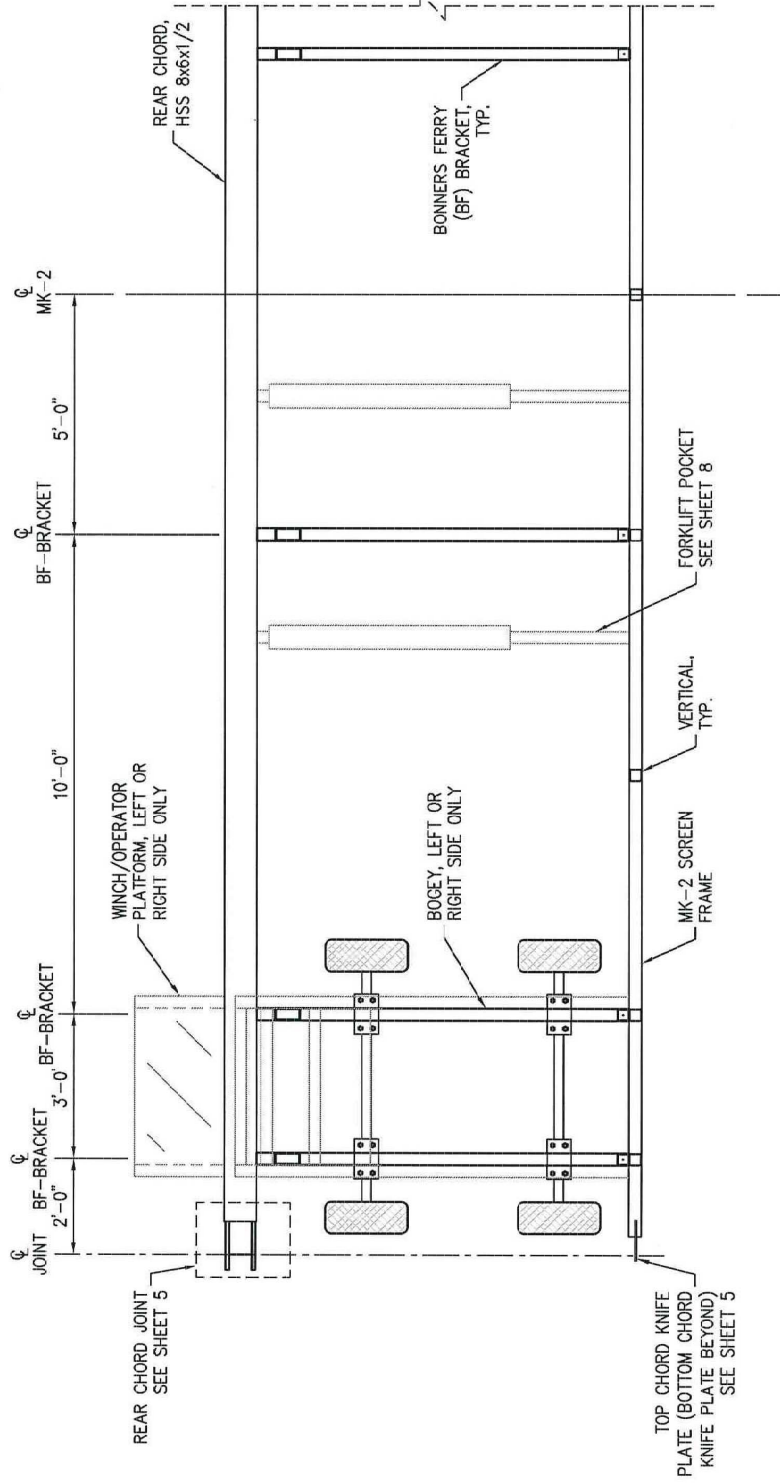
WINCH/OPERATOR PLATFORM



WINCH/OPERATOR PLATFORM

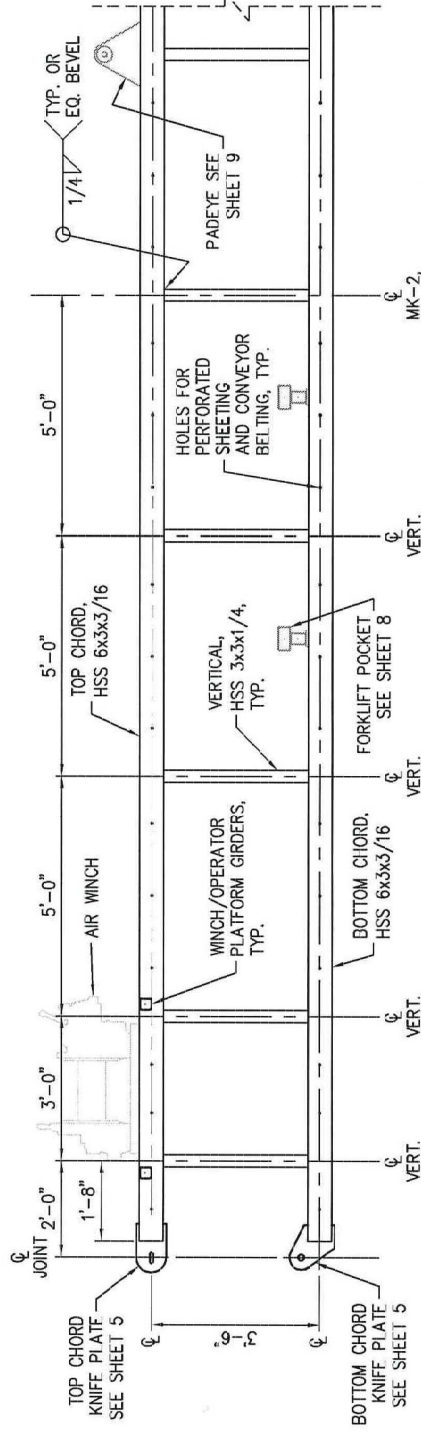


WINCH/OPERATOR PLATFORM



MK-2L (TWO TOTAL MK-2'S)

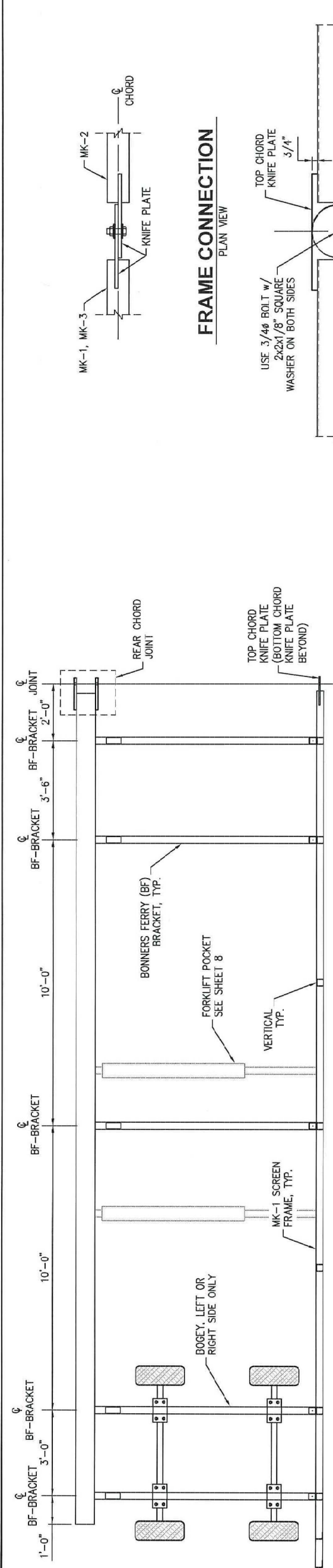
PLAN VIEW. NOTE: MK-2R SYMMETRIC ABOUT ASSEMBLY C



MK-2 SCREEN FRAME

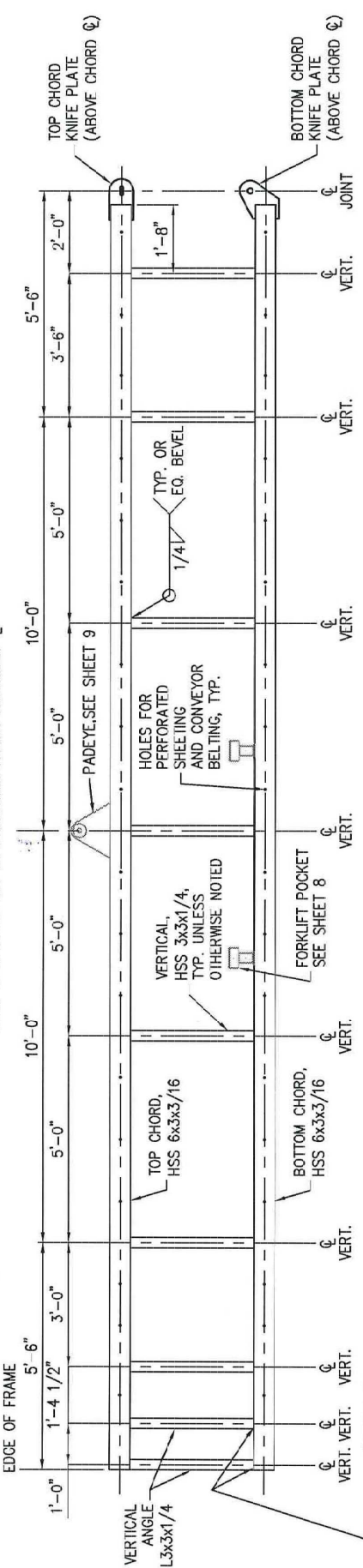


3/09/2012



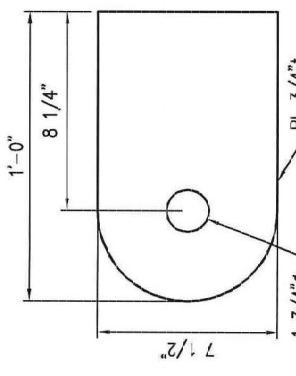
MK-1L (TWO TOTAL MK-1'S)

PLAN VIEW. NOTE: MK-1R SYMMETRIC ABOUT ASSEMBLY ϕ

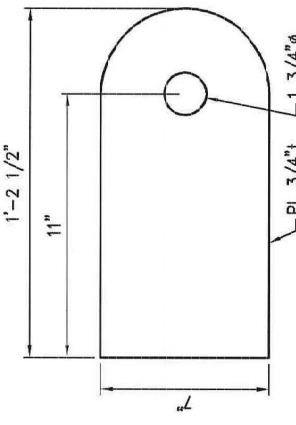


MK-1L SCREEN FRAME

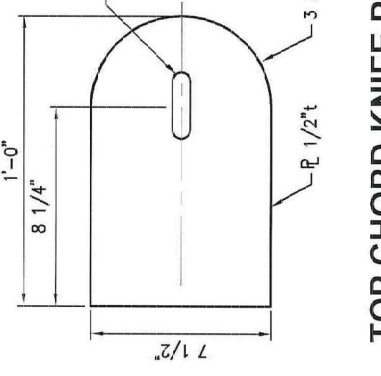
FRONT VIEW. NOTE: MK-1R SCREEN SYMMETRIC ABOUT ASSEMBLY ϕ



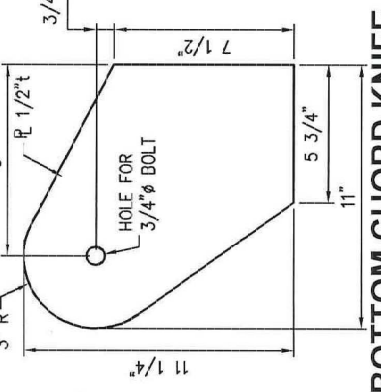
INTERIOR HINGE PLATE



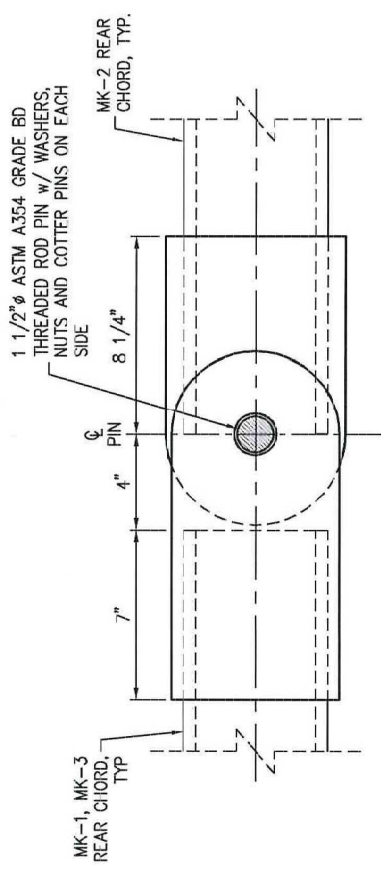
EXTERIOR HINGE PLATE



TOP CHORD KNIFE PLATE

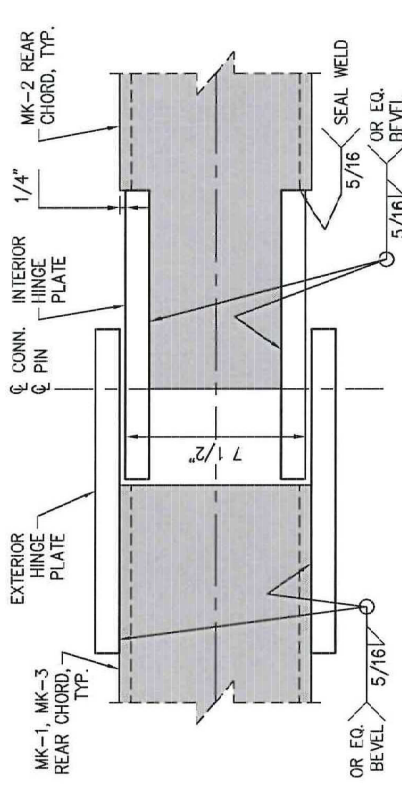


BOTTOM CHORD KNIFE PLATE



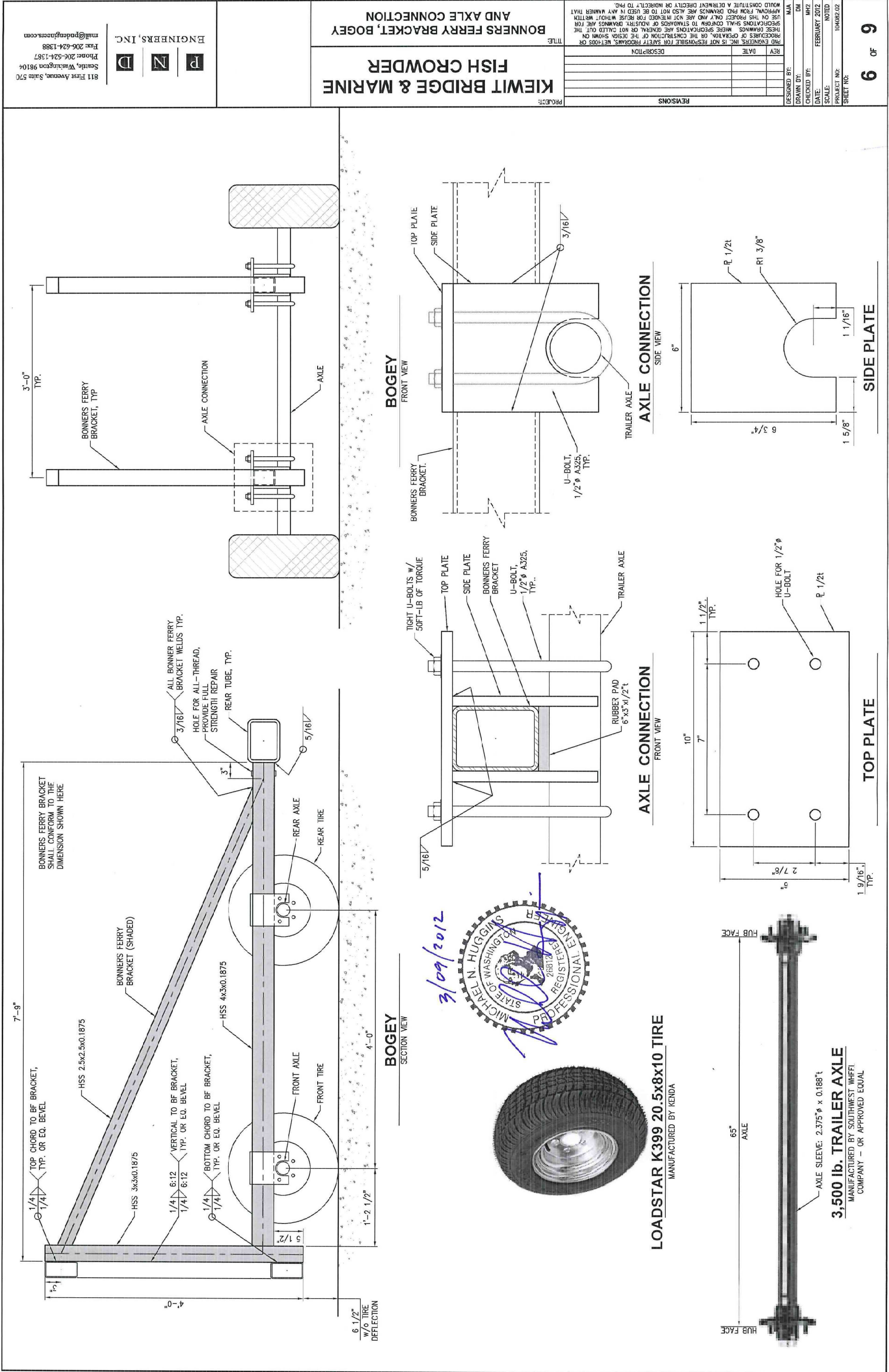
REAR TUBE CONNECTION

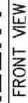
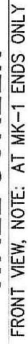
FRONT VIEW



REAR TUBE CONNECTION

PLAN VIEW





NOTE: ALL PERFORATED METAL SHEETING SHALL BE MCNICHOLS ROUND HOLE PERFORATED 18 GAGE STAINLESS STEEL. HOLES SHALL BE 1/8"Ø @ 3/16" STAGGERED

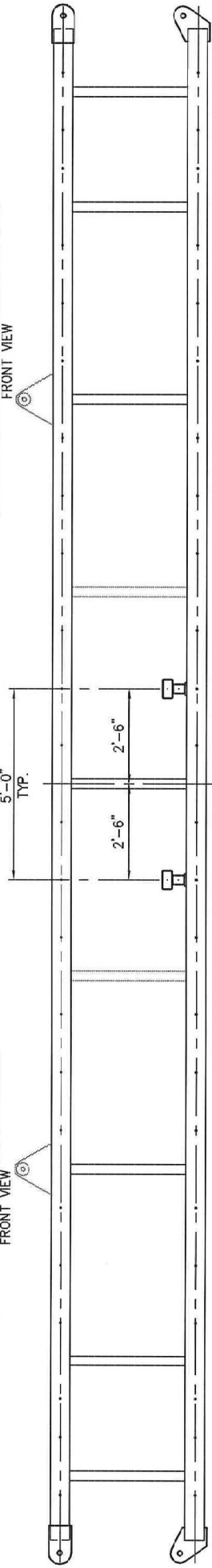


NOTE: LENGTH AND THICKNESS OF CONVEYOR BELTING BY OTHERS

- NOTES:
- FORKLIFT POCKETS INTENDED TO BE USED TO LIFT AND TRANSPORT INDIVIDUAL SECTIONS ON JOB SITE.
 - FORKLIFT FORKS SHALL BE ABLE TO SUPPORT 15,000 LBS AT 2'-0" OFFSET.
 - FORKLIFT FORKS SHALL BE 5' LONG (MINIMUM).
 - STABILITY OF FORKLIFT USED SHALL BE BY OTHERS.
 - SECTIONS SHALL BE LASHED TO THE FORKLIFT DURING LIFTING AND TRANSPORT.
 - DESIGN OF LASHING BY OTHERS

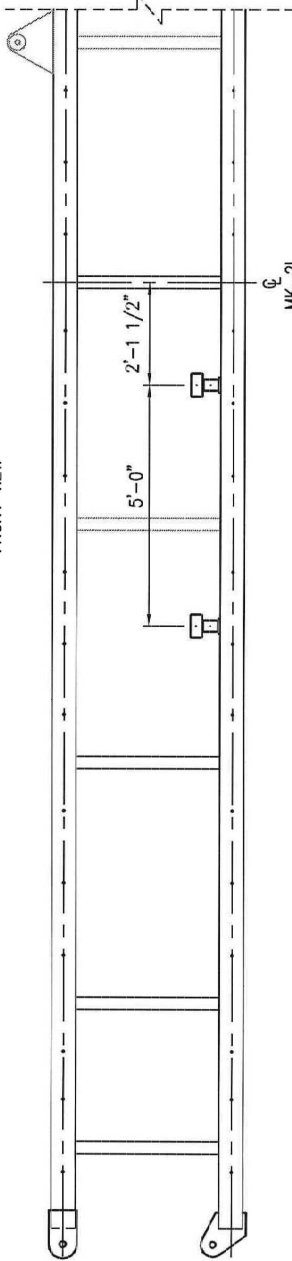
MK-3 - FORK POCKET LOCATION

MK-3



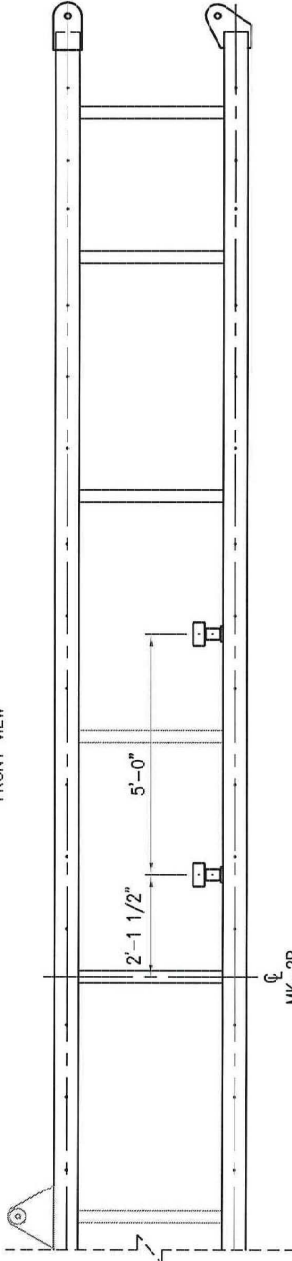
MK-2L - FORK POCKET LOCATION

MK-2L



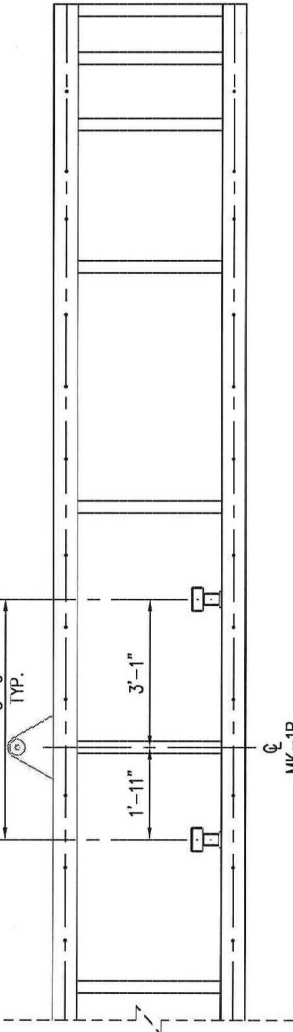
MK-2R - FORK POCKET LOCATION

MK-2R



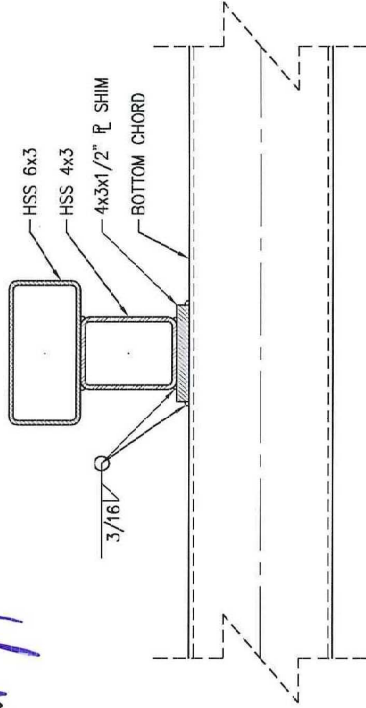
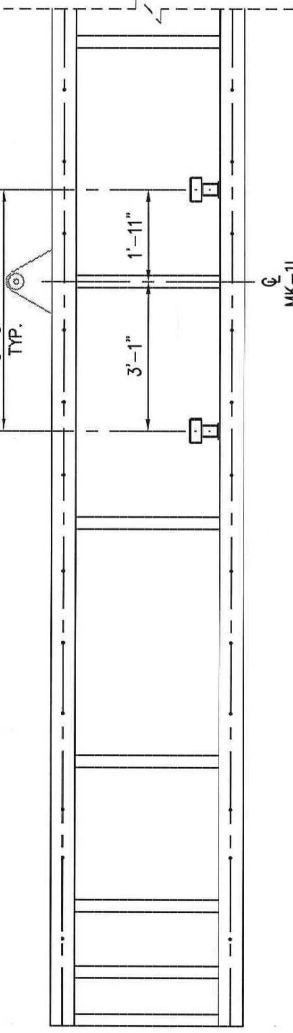
MK-1R - FORK POCKET LOCATION

MK-1R

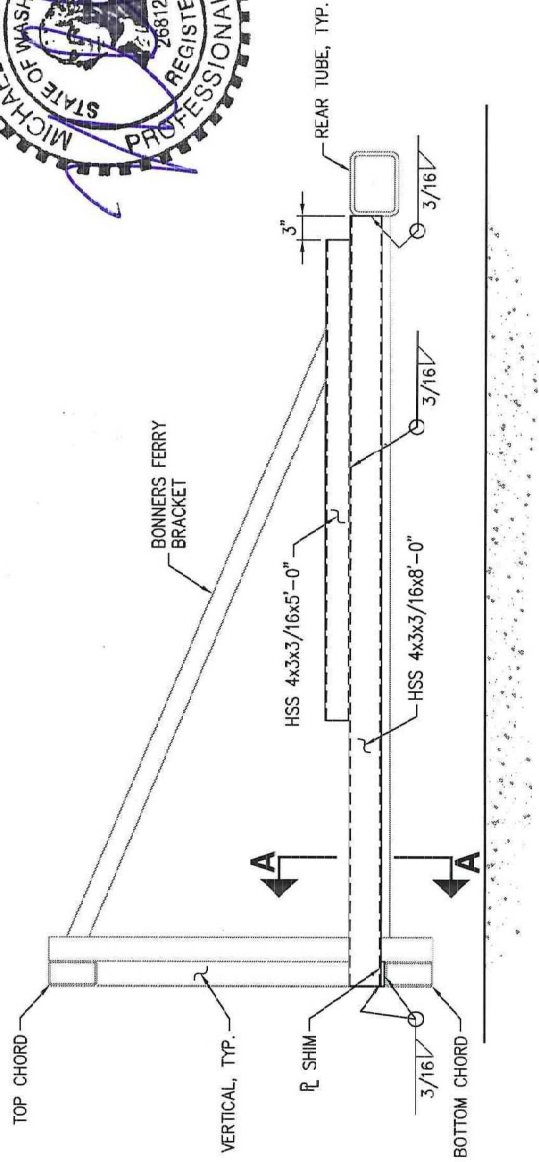


MK-1L - FORK POCKET LOCATION

MK-1L



SECTION A-A



FORKLIFT POCKET

SECTION VIEW

| REV | DATE | DESCRIPTION |
|-----|------|-------------|
| | | |
| | | |
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| | | |
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| | |
|-----------------|------------------------|
| PROJECT: | KIEWIT BRIDGE & MARINE |
| TITLE: | FISH CROWDER |
| FORKLIFT POCKET | |

| | |
|--------------|---------------|
| DESIGNED BY: | MJA |
| DRAWN BY: | DM |
| CHECKED BY: | MH2 |
| DATE: | FEBRUARY 2012 |
| SCALE: | NOTED |
| PROJECT NO: | 104082.02 |
| SHEET NO: | |

Appendix G
Fish Species List



Appendix G

Fish Species That May Be Encountered During Fish Handling Activities

| Common Name | Scientific Name | Likelihood of Encounter ¹ | Adult | Juvenile | Larvae | Reference Document | |
|---------------------------------|----------------------------------|--------------------------------------|-------|----------|--------|--------------------------------------|------------------------------------|
| | | | | | | Simenstad & Eggers 1981 ² | Simenstad et al. 2001 ³ |
| chum salmon | <i>Oncorhynchus keta</i> | Abundant | | X | | X | X |
| coho salmon | <i>Oncorhynchus kisutch</i> | Abundant | | X | | X | X |
| chinook salmon | <i>Oncorhynchus tshawytscha</i> | Abundant | | X | | X | X |
| peamouth chub | <i>Mylocheilus caurinus</i> | Abundant | X | X | | X | X |
| threespine stickleback | <i>Gasterosteus aculeatus</i> | Abundant | X | X | | X | X |
| shiner perch | <i>Cymatogaster aggregata</i> | Abundant | X | X | | X | X |
| prickly sculpin | <i>Cottus asper</i> | Abundant | X | | | X | X |
| Pacific staghorn sculpin | <i>Leptocottus armatus</i> | Abundant | X | X | | X | X |
| steelhead trout | <i>Oncorhynchus mykiss</i> | Common | | X | | X | X |
| surf smelt | <i>Hypomesus pretiosus</i> | Common | X | X | X | X | X |
| largescale sucker | <i>Catostomus macrocheilus</i> | Common | X | | | X | X |
| starry flounder | <i>Platichthys stellatus</i> | Common | X | | | X | X |
| snake prickpleback | <i>Lumpenus sagitta</i> | Infrequent | X | X | X | X | X |
| American shad | <i>Alosa sapidissima</i> | Rare | X | X | | X | X |
| native char | <i>Salvelinus spp.</i> | Rare | X | | | X | X |
| longfin smelt | <i>Spirinchus thaleichthys</i> | Rare | X | X | X | X | X |
| eulachon | <i>Thaleichthys pacificus</i> | Rare | | | | | X |
| northern pikeminnow (squawfish) | <i>Ptychocheilus oregonensis</i> | Rare | X | | | X | X |
| redside shiner | <i>Richardsonius balteatus</i> | Rare | X | | | X | X |
| bluegill | <i>Lepomis macrochirus</i> | Rare | X | X | | X | X |



| Common Name | Scientific Name | Likelihood of Encounter ¹ | Adult | Juvenile | Larvae | Reference Document | |
|-------------------|---------------------------------|--------------------------------------|-------|----------|--------|--------------------------------------|------------------------------------|
| | | | | | | Simenstad & Eggers 1981 ² | Simenstad et al. 2001 ³ |
| yellow perch | <i>Perca flavescens</i> | Rare | | | | | X |
| saddleback gunnel | <i>Pholis ornata</i> | Rare | X | X | | X | X |
| English sole | <i>Pleuronectes vetulus</i> | Rare | X | | | X | X |
| river lamprey | <i>Lampetra ayresi</i> | Rare | X | X | | X | |
| Pacific herring | <i>Clupea harengus pallasii</i> | Rare | X | X | X | X | |
| northern anchovy | <i>Engraulis mordax</i> | Rare | X | X | X | X | |
| whitebait smelt | <i>Allosmerus elongatus</i> | Rare | | X | X | X | |
| bay pipefish | <i>Syngnathus leptorhynchus</i> | Rare | X | X | | X | |
| pile perch | <i>Rhacochilus vacca</i> | Rare | | X | X | X | |
| canary rockfish | <i>Sebastes pinniger</i> | Rare | | X | | X | |
| sculpin | <i>Clincottus sp.</i> | Rare | | X | | X | |

Notes:

- ¹ Likelihood of encounter follows the descriptions in *Decadal Development of a Created Sough in the Chehalis River Estuary: Year 2000 Results* (Simenstad et al. 2001). The highest level of abundance observed was used to characterize the likelihood. The likelihood ratings are Abundant, Common, Infrequent (but often abundant when occurring), and Rare, with Abundant being the most likely to be encountered and Rare the least likely to be encountered.
- ² Simenstad, C.A. and D.M. Eggers. 1981 *Juvenile Salmonid and Baitfish Distributions, Abundance, and Prey Resources in Selected Areas of Grays Harbor*. Grays Harbor and Chehalis River Improvements to Navigation Environmental Studies. Final Report to Seattle District, U.S. Army Corps of Engineers. August.
- ³ Simenstad, C.A., A.J. Wick, J.R. Cordell, R.M. Thom, and G.D. Williams. 2001. *Decadal Development of a Created Sough in the Chehalis River Estuary: Year 2000 Results*. Report to U.S. Army Corps of Engineers, Seattle District. October.

Appendix H

Timing of Salmonid Occurrence in Grays Harbor and Fish Migration Window Chart

**SR 520 Pontoon Construction
Design-Build Project**

**Appendix H
Timing of Salmonid Occurrence in Grays
Harbor and Fish Migration Window Chart**

**Prepared By:
Kiewit-General, A Joint Venture**

**Prepared For:
Washington State Department of Transportation**

September 2011

FINAL





Appendix H

Timing of Salmonid Occurrence in Grays Harbor and Fish Migration Window Chart

Grays Harbor Salmonids

A literature review was conducted by K. Michael McDowell of Confluence Environmental Company in August 2011 to determine the timing of salmonid occurrence in Grays Harbor.

The Grays Harbor estuary provides rearing habitat and a migration corridor to several species of anadromous salmonids, including chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), chum (*O. keta*), and steelhead (*O. mykiss*). Six rivers and many small creeks and streams drain to the estuary and provide spawning and rearing habitat for these fish. There are both naturally spawning populations and hatchery stocks of these species in the Grays Harbor watershed, which produces a complex temporal and spatial distribution of juvenile outmigrants from the system. None of these salmon species have stocks from Grays Harbor that are listed under the Endangered Species Act (ESA). Bull trout (*Salvelinus confluentus*)—recognized under the broader native char category with Dolly Varden (*S. malma*)—are, however, listed as threatened under ESA. Bull trout are encountered occasionally in Grays Harbor, but there are no known spawning populations in the watershed (Simenstad and Eggers 1981, Jeanes and Morello 2006).

The following discussion addresses what is known about the timing and distribution of these fish in the estuary based on studies conducted there, primarily from 1980 to 2004 (Simenstad and Eggers 1981, Simenstad et al. 2001, Jeanes and Morello 2006). Simenstad and Eggers (1981) remains the most comprehensive study of fish movements through the estuary that has been conducted. Jeanes and Morello (2006) summarizes studies that specifically targeted native char presence in the estuary. Jeanes and Morello used sampling equipment and procedures that were based on those used by Prinslow et al. (1981) to capture and enumerate many of the species of interest to this discussion. Simenstad et al. (2001) used different methods focusing on fish use in sloughs in the estuary located about 1 mile upstream of the pontoon facility and, therefore, presents data relevant to the present discussion as well as summarizing results of studies over a period of 10 years (1990–2000).

The following discussion is presented by species.



Chum Salmon

Juvenile chum salmon are perhaps the most numerous of the juvenile salmon moving through the Grays Harbor estuary (Jeanes and Morello 2006). They are also the earliest of the juvenile salmon to arrive in the estuary each year with the outmigration period likely beginning in February (Prinslow et al. 1981). These fish also appear to move through the estuary fairly quickly; especially the upper and middle portions of the estuary where there was little evidence of growth in populations sampled over a period of weeks in the sampling conducted by Prinslow et al. (1981). This was especially true in the early part of the run. Evidence from sampling indicated a possible residence time in the lower estuary (e.g., Stearn's Bluff and Westport sampling stations) of between 2 to 4 weeks. No juvenile chum salmon were caught after mid-May at any sampling site in the estuary (Prinslow et al. 1981). This result is consistent with those reported by Simenstad et al. (2001) where in their upstream sampling sites the peak encounters of chum salmon juveniles were in March and April with almost no fish seen in May, and none in June sampling events. Jeanes and Morello (2006) reported no captures of juvenile chum salmon after March in their sampling efforts focused on the river reach between Aberdeen and Cosmopolis.

Therefore, the best information available regarding the timing and distribution of juvenile chum salmon indicates the outmigration likely beginning in February with peaks in abundance during March and April in the middle estuary. These fish have likely left the estuary for their ocean residence by the middle of May. Thus, the most likely time period to encounter these fish at the pontoon construction facility would be the months of March and April.

Chinook Salmon

Juvenile chinook salmon likely are present in the estuary over a greater period of time than any of the other salmonid species in the Chehalis system. These fish were encountered as early as February (Jeanes and Morello 2006) and March (Prinslow et al. 1981), which were the earliest sampling events for both of these studies. In both cases the numbers were low early in the season, reaching peak abundance in April through June in the upper estuary. In the lower estuary, these fish peaked in abundance in May and again in July with a fairly rapid reduction in catches in August and small numbers continuing until the end of sampling in October (Prinslow et al. 1981). A notable behavioral change was noted in the catch data from Prinslow et al. (1981) where catches of juvenile chinook salmon declined in beach seine sets while increasing in purse seine sets in June and July and later in the year. This was attributed to the growing fish in the estuary moving away from shore and more into open water as they



increased in size. This offshore movement in juvenile salmon has been noted in other outmigration studies (Bax et al. 1980).

Therefore, the best information available regarding the timing and distribution of juvenile chinook salmon indicates the outmigration likely beginning in February with peaks in abundance during May and June in the middle estuary. These fish likely remain in the estuary, in small numbers, through at least October. There is some evidence that these fish move away from nearshore habitats as they grow during their residence in the estuary. This behavioral change may make it less likely to encounter these fish at the pontoon facility later in the year. Thus, the most likely time period to encounter these fish at the pontoon construction facility would be the months of May and June.

Coho Salmon

Coho salmon are likely present in the estuary for the shortest period of the juvenile salmon discussed here. An examination of the available data also suggests that these fish move through the estuary fairly rapidly as no significant growth was reported in fish captured over time from the upper to lower estuary sampling sites by Prinslow et al. (1981). These fish also enter the estuary at a much larger size (100 to 170 mm) than either the chum (35 to 50 mm) or chinook (35 to 60 mm) juveniles. The catch data suggest that these fish use both nearshore and offshore environments equally during their estuarine residence period. These fish were most abundant in the upper estuary from mid-April to the beginning of June. The lower estuary sites saw peak catches in mid- to late June when it was apparent that these fish were moving out of the estuary. These fish were not encountered at any sampling sites after the last week in June (Prinslow et al. 1981).

Therefore, the best information available regarding the timing and distribution of juvenile coho salmon indicates the outmigration likely beginning in April with peaks in abundance during May in the middle estuary. These fish have likely left the estuary for their ocean residence by the end of June. Thus, the most likely time period to encounter these fish at the pontoon construction facility would be the months of late April and May.

Native Char

Adult and sub-adult native char have been encountered occasionally in Grays Harbor in several studies (Prinslow et al. 1981, Jeanes and Morello 2006). The totality of the available historical data for these fish was summarized by Jeanes and Morello (2006), which included catches of 15 individual fish reported in 7 different studies between 1966 and 2000. In addition, an intensive sampling for the U.S. Army Corps of Engineers conducted over a number of years by R2 Resource Consultants focused on the capture



of native char in Grays Harbor over a 4-year period from 2001 to 2004 and captured an additional 15 of these fish. None of the captured native char were juvenile fish. The size range for fish captured during these intensive studies was 224 to 520 mm (8.8 to 20.5 inches). The size of the fish caught during the historical studies was not generally reported except for Prinslow et al. (1981) that captured two native char of 440 mm (17.3 inches) and 550 mm (21.7 inches). Jeanes and Morello (2006) concluded that all of these fish were either sub-adults (3+ years) or adults (4+ and 5+ years).

All of the fish catches during these intensive studies occurred between February 19 and April 23 with the majority caught in March. The two fish captured by Prinslow et al. (1981) were also captured in March. Other historical captures range over the period from early March to as late as July 14. Jeanes and Morello (2006) implanted acoustic tags in 7 of the 15 fish they captured. Four of these fish made return trips to Grays Harbor in years subsequent to their capture and tagging, 1 of these returned in 3 successive years. Two of the 7 tagged fish were subsequently caught in the Hoh River, 80 miles north of Grays Harbor.

From this discussion, the presence of native char in the Grays Harbor estuary appears to be very limited and episodic. The spring, particularly the month of March, appears to be the time when these fish are most likely to be encountered in the vicinity of the pontoon facility; however, they may also be present in the area through mid-July. Their generally very low abundance makes encountering these fish at the pontoon facility likely to be a very low probability.

References

- Bax, N.J., E.O. Salo, and B.P. Snyder. 1980. *Salmonid outmigration studies in Hood Canal, Final Report, Phase V*. Fisheries Research Institute, University of Washington. FRI-UW-8010. August.
- Jeanes, E. D. and Morello, C. M. 2006. *Native Char Utilization: Lower Chehalis River and Grays Harbor Estuary, Aberdeen, Washington*. Report to U.S. Army Corps of Engineers, Seattle District. March.
- Prinslow, T. E., K. M. McDowell, and C. A. Simenstad. 1981. "Distribution and abundance of juvenile salmonids." in *Juvenile Salmonid and Baitfish Distribution, Abundance, and Prey Resources in Selected Areas of Grays Harbor, Washington*, eds. Simenstad, C.A and D. M. Eggers eds. Prepared by Fisheries Research Institute for US Army Corps of Engineers. FRI-UW-8116. University of Washington, Seattle. September.



Simenstad, C. A. and D. M. Eggers. 1981. *Juvenile Salmonid and Baitfish Distribution, Abundance, and Prey Resources in Selected Areas of Grays Harbor, Washington*. Prepared by Fisheries Research Institute for US Army Corps of Engineers. FRI-UW-8116. University of Washington, Seattle. September.

Simenstad, C. A., A. J. Wick, J. R. Cordell, R. M. Thom, and G. D. Williams. 2001. *Decadal development of a created slough in the Chehalis River estuary: Year 2000 results*. Report to US Army Corps of Engineers, Seattle District. April.

| | Jan | Feb | Mar | April | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|
| Fry, Smolt, Juvenile Salmon | | | | | | | | | | | | |
| Chinook Juvenile ¹ (less than 1 year old) | | | | | | | | | | | | |
| Chum Juvenile (less than 1 year old) | | | | | | | | | | | | |
| Coho Smolt (1+ year old) | | | | | | | | | | | | |
| Steelhead Smolt (primarily 2+ years old) | | | | | | | | | | | | |
| Coho Fry ² (<1 year old) | | | | | | | | | | | | |
| Steelhead Fry ² (<1 year old) | | | | | ??? | | | | | | | |
| Adult Salmon | | | | | | | | | | | | |
| Wild Chinook ³ | | | | | | | | | | | | |
| Chum | | | | | | | | | | | | |
| Wild Coho | | | | | | | | | | | | |
| Wild Steelhead | | | | | | | | | | | | |

Notes:

Fish migration window information provided by the Quinalt Indian Tribe in 2011.

- 1 In North Coastal Streams ocean-type chinook fry begin emerging from the gravel in late February, beginning furthest upriver, where the earliest entering chinook spawn first.
- 2 Small group relocating to lower Grays Harbor tributaries.
- 3 Spring/summer stock (April to August 31), fall stock (September to November 30).



**Fish Handling Plan
SR520 Pontoon Construction
Design-Build Project
Aberdeen, Washington**

**Appendix H
Fish Migration Window Chart**

Appendix J

NMFS In-Water Construction Monitoring Report



Appendix J NMFS In-water Construction Monitoring Report

Note: This form was provided in the NMFS BO to document all SDPS green sturgeon and SDPS eulachon that are encountered during the float-out cycles. This report, or equivalent, needs to be submitted to NMFS within 30 days of each float-out cycle.

Start Date: _____

End Date: _____

Waterway: _____ in _____ County

Construction Activities: _____

Number of fish observed: _____

Number of sturgeon observed (what kind?): _____

Number of smelt observed (what kind?): _____

What were the fish observed doing prior to construction? _____

What did the fish do during and after construction? _____

Number of fish stranded as a result of this activity: _____

How long were the fish stranded before they were captured and released? _____

Number of fish that were killed during this activity: _____

Appendix K

Fish Handling Plan Notifications and Reporting Summary



Appendix K Fish Handling Plan Notifications and Reporting Summary

Notification Requirements

| Service or Agency | Notification Requirement | Notification To | Timing/Date |
|-------------------|---|--|---|
| NMFS BO | If sick, injured, or dead specimen of a threatened or endangered species is found in action area | NMFS Law Enforcement (206) 526-6133, or (800) 853-1964 via Michael Grady and NMFS WA State Habitat Office (360) 753-9530 | Upon observation |
| USFWS BO | If dead, injured or sick threatened or endangered species specimen is located | USFWS Law Enforcement Office at (425) 883-8122, or WA Fish and Wildlife Office at (360) 753-9440 | Within 3 working days upon locating specimen |
| WDFW HPA | If at any time, as a result of project activities fish are observed in distress, a fish kill occurs, or water quality problems develop (including equipment leaks or spills) | Washington Military Department's Emergency Management Division at (800) 258-5990 and to the Area Habitat Biologist, Amy Spoon (360) 249-1228 | Upon observation |
| Ecology | If at any time, as a result of project activities, fish are observed in distress, a fish kill occurs, or water quality problems develop (including equipment leaks or spills) | Kerry Carroll, Federal Project Manager; (360) 407-7503 Kstr461@ecy.wa.gov | Upon observation |
| WDFW | Pre-activity notification | District Fish Biologist (Address and Name TBD) | Prior to float-out cycles |

Abbreviations:

BO Biological Opinion
Ecology Washington State Department of Ecology
HPA Hydraulic Project Approval
NMFS National Marine Fisheries Service
TBD To Be Determined
USFWS U.S. Fish and Wildlife Service
WA Washington
WDFW Washington Department of Fish and Wildlife



Reporting Requirements

| Service or Agency | Plan/Report Submittal | Submittal Info | Timing/Date |
|-------------------|---|--|---|
| NMFS BO | Fish Handling Plan | NMFS | August 1, 2011 |
| | In-water Construction Monitoring Report (Appendix B of Fish Handling Plan) Documenting all green sturgeon and eulachon encountered | Washington State Habitat Office, Attn: Michael Grady 510 Desmond Drive SE, Suite 103 Lacey, WA, 98503 | Within 30 days of each pontoon float-out cycle/fish handling activity |
| USFWS BO | Fish Handling Plan | Washington Fish and Wildlife Office | August 1, 2011 |
| | Monitoring Report—Fish Handling Operations Documenting all bull trout encountered | Attn: Transportation Planning Branch—Ryan McReynolds 510 Desmond Dr. SE, Suite 102, Lacey, WA 98503 | Within 30 days of each pontoon float-out cycle/fish handling activity |

Abbreviations:

BO Biological Opinion
NMFS National Marine Fisheries Service
TBD To Be Determined
USFWS U.S. Fish and Wildlife Service
WA Washington
WDFW Washington Department of Fish and Wildlife

Appendix L

Casting Basin Water Data Collection Plan



Appendix L

Casting Basin Water Data Collection Plan

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List of Abbreviations/Acronyms

| Acronym/ Abbreviation | Definition |
|----------------------------------|--|
| DO | Dissolved oxygen |
| mg SS/L | Milligrams suspended solids per liter |
| NTU | Nephelometric Turbidity Units |
| ppm | Parts per million |
| TSS | Total suspended solids |
| WDFW | Washington State Department of Fish and Wildlife |
| WSDOT | Washington State Department of Transportation |



1.0 Introduction

This Casting Basin Water Data Collection Plan describes water quality monitoring that will be conducted during fish removal activities within the casting basin following replacement of the gate after the pontoon float out. The monitoring will focus on how the water quality conditions may change in different parts of the casting basin during and after specific fish removal activities. The monitored parameters will be total suspended solids (TSS), dissolved oxygen (DO), and temperature. These data will assist the biologists to understand basin conditions during fish handling, and will inform whether TSS may be present at levels that could cause moderate physiological stress to fish. Data collected will also assist the Washington State Department of Transportation (WSDOT) Directing Biologist and Kiewit-General (K-G) Environmental Compliance Manager in determining whether adaptive management actions need to be implemented in order to protect fish life. The plan was prepared in response to Washington State Department of Fish and Wildlife (WDFW) comments about casting basin water quality during the first float out event.

2.0 Basin Monitoring

Monitoring for TSS, DO, and temperature will be conducted in the casting basin during casting basin drawdown, power crowder operations, and fish handling. Monitoring will be conducted in a manner that will allow comparison of the TSS data to threshold levels described in Section 3.0.

Monitoring will be conducted using a handheld, instantaneous readout instrument at several locations in the casting basin and at the float in the launch channel where fish will be released. Monitoring will be conducted sequentially, and it is assumed that the monitoring can be conducted by one dedicated staff person. . All water quality readings will be collected at the mid-point in the water column.

The monitoring locations are based on the fish handling activities and are focused on where the fish will be active during fish collection, and will also provide informational data in other locations of the basin. Monitoring will typically be collected on an hourly basis throughout the fish removal activities Table L.1 lists the monitoring locations and frequency by fish handling activity and Figure L.1 shows the monitoring locations. Refer to Table L.1 and Figure L.2 for specific information on when and where monitoring will be conducted.



All monitoring data will be recorded in a field notebook using the form in Attachment L.1. The data will be maintained by K-G for the duration of the project in support of adaptive management decisions.

DO measurements will be compared to contract requirements, and DO managed accordingly. Requirements are that DO shall be held at 7 parts per million (ppm) or greater to the greatest extent practicable, and shall never be allowed to fall below 5 ppm when the water in the casting basin is drawn down to a level of 3 feet or less with fish potentially present. Oxygen shall be added by the Design-Builder, using airstones or other means, to hold DO above the minimum levels as necessary.

3.0 Total Suspended Solids Thresholds

The TSS monitoring data will be compared to published reports characterizing the predicted fish effects in order to identify an upper limit of acceptable TSS exposure. The effects to fish depend on both the TSS concentration and the duration of exposure. Effects can range from no effect or mild behavioral alterations to major developmental impacts or mortality. Newcombe and Jensen (1996) synthesized the studies on TSS concentrations and developed a model of predicted fish effects based on the concentrations and duration of exposure to TSS.

The threshold of TSS used to identify potential concern during fish handling will be those exposure levels that cause moderate physiological stress to juvenile salmonids. In this way, the acceptable TSS exposure during fish handling are those levels predicted to cause at most only minor, temporary behavioral or physiological effects and avoid moderate or major effects. In the Newcombe and Jensen model, the moderate physiological stress is assigned an effect level of 6 on a scale of 0 (no effect) to 14 (>80–100% mortality; refer to Table L.2).

During fish handling activities for the pontoon construction project, monitoring data will be compared to the TSS concentration and duration thresholds presented in Table L.3, below. These thresholds have been selected based on information in the Newcombe and Jensen document.



**Table L.3.
TSS Thresholds**

| Thresholds of Concern (TSS [mg SS/L] and Duration) |
|--|
| Above 1,100 mg SS/L for 1 hour or more (measured in 2 consecutive hourly readings) |
| Above 400 mg SS/L for 3 hours or more |
| Above 150 mg SS/L for 7 hours or more |

4.0 Use of Data for Adaptive Management

The casting basin water quality monitoring data will be used to identify potential turbidity conditions that could cause permanent harm to fish. This information will be used to trigger discussion of potential adaptive responses to reduce TSS exposure.

In the event that consecutive TSS readings within a specific area of the basin where fish are present exceed the acceptable thresholds of both magnitude and duration listed above in Table L.3, the WSDOT Directing Biologist (Chris Czesla), the K-G Environmental Compliance Manager (Norma Hernandez), and the K-G General Superintendent (Jeff Billows) will be notified. At that time, WSDOT and K-G will discuss the monitoring result and appropriate adaptive management actions to take. The WSDOT Directing Biologist will additionally consult with WDFW if a representative is immediately available for participation in the discussion.

Adaptive management actions will be determined based on the specific status of the fish handling process and basin conditions at the time. Adaptive management actions could include modifying how or when turbidity-generating activities are conducted, modifying fish collection activities, expediting fish removal, or other actions that may be identified during fish removal activities.

5.0 References

Newcombe, C.P. and J.O.T. Jensen. 1996. "Channel Suspended Sediment and Fisheries: A Synthesis for Quantitative Assessment of Risk and Impact." North American Journal of Fisheries and Management 16(4): 693-727.



Table L.1. Casting Basin Water Data Collection Schedule

| Float Out- and Fish Handling-Related Activity | Water Quality Sampling Frequency | Data Collection Location ¹ | | | | | | | Purpose |
|--|----------------------------------|---------------------------------------|----|----|----|---|---|---|---|
| | | A | B1 | B2 | B3 | C | D | E | |
| During Basin Drawdown until Fish Removal Activities Commence | Hourly | | X | X | | | | | Monitor conditions during basin drawdown |
| During Power Crowder Operations | Hourly | X | X | X | X | | | | Monitor changes caused by power crowder |
| During Fish Removal Operations in "Alley" Near Gate | Hourly | X | X | X | | X | X | X | Monitor conditions in casting basin during fish handling, particularly in the area where fish will be handled |
| During Fish Removal Operations after Angled Screen in Place | Hourly | X | X | X | | | X | X | Monitor conditions in casting basin throughout fish handling |

Notes:

- 1 Sample locations details can be found on Figure L.1 of this Appendix.



Table L.2. Predicted Severity of Fish Effects (left) and Corresponding Table of Severity of Effects Categories (right).

| (B) | Average severity-of-ill-effect scores (calculated) | | | | | | | | | | | | | | | | | | | | | | | |
|--------|--|----|----|----|----|----|------|----|----|----|----|----|-------|----|----|----|----|----|--------|----|----|----|----|----|
| | Hours | | | | | | Days | | | | | | Weeks | | | | | | Months | | | | | |
| 162755 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 58874 | 9 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 22026 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 8103 | 7 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 2981 | 6 | 7 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1097 | 6 | 6 | 7 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 403 | 5 | 6 | 6 | 7 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 148 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 55 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 20 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 7 | 2 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 3 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 1 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| | 1 | 3 | 7 | 1 | 2 | 6 | 2 | 7 | 4 | 11 | 30 | | | | | | | | | | | | | |

| SEV | Description of effect |
|-----|---|
| 0 | Nil effect No behavioral effects |
| 1 | Behavioral effects Alarm reaction |
| 2 | Abandonment of cover |
| 3 | Avoidance response |
| 4 | Sublethal effects Short-term reduction in feeding rates; short-term reduction in feeding success Minor physiological stress; increase in rate of coughing; increased respiration rate |
| 5 | Moderate physiological stress |
| 6 | Moderate habitat degradation; impaired homing |
| 7 | Indications of major physiological stress; long-term reduction in feeding rate; long-term reduction in feeding success; poor condition |
| 8 | Lethal and para-lethal effects Reduced growth rate; delayed hatching; reduced fish density 0–20% mortality; increased predation; moderate to severe habitat degradation >20–40% mortality >40–60% mortality >60–80% mortality >80–100% mortality |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |

Source: Newcombe and Jensen (1996).

| | |
|--|--|
| <div data-bbox="365 888 402 1228" data-label="Section-Header"> <p>Explanation of Diagram</p> </div> <div data-bbox="410 445 699 1673" data-label="Diagram"> <p>The diagram shows a rectangular Casting Basin. On the left side, there is a 'Float in Entrance Channel' box. Below it, a 'Gate' is indicated. To the right of the gate is a 'Fish Removal Alley'. Further right is a 'Power Crowder' area. At the bottom left, 'Pumps' are labeled. At the bottom right, a 'Ramp' is shown.</p> </div> <div data-bbox="808 1556 867 1673" data-label="Text"> <p>E</p> </div> <div data-bbox="808 741 846 1377" data-label="Section-Header"> <p>Proposed Water Quality Sampling Locations</p> </div> <div data-bbox="862 445 1109 1476" data-label="Diagram"> <p>The diagram shows the same Casting Basin layout as above, but with three sampling locations marked in red: 'B1' is located in the front of the Power Crowder area; 'B2' is located behind the Power Crowder area; and 'B3' is located in the back of the basin. There are also labels 'A', 'D', and 'C' near the bottom left corner.</p> </div> <div data-bbox="1146 541 1211 1470" data-label="Text"> <p>Locations B1 and B3 should be located in areas of the basing representative of conditions in front of and behind the power crowder</p> </div> | <div data-bbox="1377 1619 1528 1766" data-label="Image"> </div> <div data-bbox="1377 825 1528 1274" data-label="Section-Header"> <p>Fish Handling Plan SR 520 Pontoon Construction Design-Build Project Aberdeen, Washington</p> </div> <div data-bbox="1393 94 1507 462" data-label="Caption"> <p>Figure L.1 Casting Basin Water Data Collection Locations</p> </div> <div data-bbox="1539 1024 1563 2005" data-label="Page-Footer"> <p>\\Merry\data\projects\KG-ABERDEEN\Revised Fish Handling Plan\Appendices\Appendix L Casting Basin Mon\520 FHP Figure L1 012213.docx</p> </div> <div data-bbox="1539 90 1563 245" data-label="Page-Footer"> <p>February 2013</p> </div> |
|--|--|



Attachment L.1 Field Reporting Form

Monitoring Personnel: _____ Date: _____

Page _____ of _____

Current Field Conditions

Weather: _____ Ambient Temperature: _____

Daily Meter Calibration Performed ☐ Notes: _____

Water Quality Monitoring Summary

| Fish Handling Activity | Activity Start Time | Station Location | Time | Temp. (°C) | TSS (mg/L) | DO (mg/L) | Notes |
|------------------------|---------------------|------------------|------|------------|------------|-----------|-------|
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Appendix M

Operational Fish Handling: Narrative of Activities



Appendix M

Operational Fish Handling: Narrative of Activities

This narrative is to help explain the changes to the procedure for handling fish for Cycles 2 thru 6 incorporating the lessons learned from Cycle 1.

Block and Seine Nets

In order to limit the number of fish that enter the basin, the block net will be deployed as soon as the last pontoon exits through the basin gate. While the block net deployment operation is under way, the seine net will be readied at the north end of the basin. In preparation for cycle two, the seine net attachments have been modified to better suit the geometry of the casing basin, thereby effectively encouraging fish off the basin slab, and minimizing areas of egress along the basin wall. The seine crew will first assemble the net and attach it to the skiffs; subsequently, they will begin travelling south toward the gate. A crane will be attached to the block net in front of the gate, and once the seine net is within close proximity, the block net will be removed, allowing the seine net to pass through the basin gate into the launch channel. Once the seine crew has safely exited the basin, the block net will be replaced, and will remain in place until installation of the casting basin gate is complete. Expedient deployment of the block net will reduce the amount of time that the basin is exposed to random fish entry, and will prove to be relatively simple means of reducing the overall number of fish trapped inside the basin. After the installation of the casting basin gate is complete, the dewatering system will promptly be activated and the water level will be drawn down to the pre-determined fish handling depth of 30 inches.

Power Crowder

During cycle one float out, several inefficiencies were identified in the operation of the power crowder. These inefficiencies have been discussed in depth during lessons learned meetings and brain storming sessions focused on increasing the efficacy of the crowder. As a result, the power crowder operation in cycle two will have several noteworthy differences to that of cycle one.

First, the end sections of the crowder were identified as being areas where fish were likely to evade the herding effort. Consequently, the end sections of the crowder will be removed and replaced with an enhanced end section that accommodates movement



from side-to-side and will maintain contact with the basin wall while the power crowder advances through the basin.

Second, during crowder assembly in cycle one, a work skiff was utilized to haul the winch cable the length of the basin, from the assembly location at the north end, to the concrete blocks near the basin gate. Using the skiff in this application caused some noticeable sediment agitation. In efforts to minimize turbidity, a cable deployment system has been developed that will effectively eliminate the need for a skiff to haul the cable from one end of the basin to the other.

Finally, due to the unanticipated number of benthic fish species that were encountered in cycle one; the power crowder will be outfitted with a “tickler chain” to encourage the bottom dwelling fish to enter the water column out in front of the crowder. The tickler chain concept was born out of brain storming sessions with professional biologist, as well as other experts in the realm of fish handling, and is expected to reduce the number of benthic species that evaded the crowder by seeking refuge in the migratory sediment.

The assembly and operation of the crowder will be practiced prior to float out in order to limit assembly time, and resolve operating inefficiencies noted in cycle one lessons learned. Once the Crowder is assembled at the north end in the basin, the two anchor blocks will be set at the south end and the cables will be drawn out. The crowder will be pulled down to the south end such that it creates a 4-ft corridor between the face of the crowder and the bulkhead wall. Once the 4-ft channel is established, the crowder blocks can be removed and fish handling operations inside the 4-ft corridor will commence.

Fish Handling

Once the crowder reaches the south end and develops the 4-ft channel, the manual fish handling activities will begin. As previously mentioned, cycle two will incorporate several lessons learned, for instance, the fish handling corridor will be truly 4-ft wide and will include partitions to compartmentalize sections of the channel as they are cleared. Another major change to the fish handling operation is the revised design of the gate screen partitions to increase the uniformity of the 4-ft fish handling corridor along the face of the casting basin gate. The revision to the screen partitions along the face of the gate will eliminate odd areas that are difficult to work around and increase the efficiency of the poles seines.



To further increase the efficiency of fish handling in the 4-ft channel, a wheel mounted push screen will be incorporated for use in addition to the pole seines used in cycle one. Also, beginning in cycle two, fish handling in the 4-ft channel will work from east-to-west. Revising the direction of fish handling activities will accomplish two primary objectives; first, it will clear the hydraulic control structure (HCS) pump area at the beginning of the operation, thereby limiting the fish exposure to impingement on the screen. Second, moving the collection and release point from the east end to the west end will provide better access for biologist to observe fish activity upon release via the temporary floating dock located on the west side of the launch channel.

The fish handling operation within the 4-ft channel will start off by setting the fish box just east of the sluice gate area. Using pole seines, and the wheel mounted push screen, the area in front of the HCS pump shed will be cleared, and a block partition will be installed preventing fish from entering the area previously cleared. After the push screen has cleared the area, a seine net will be used from the push screen to the fish box and will be deposited into the box as many times as necessary to clear the area. The box will be flown out of the corridor to the release point and then re-installed into the channel 10-ft east of the crowder break down point. The push screen will again be advanced to within 6-ft of the box and a new block partition will be installed just west of the push screen. The dip seine will again be used to clear that part of the channel and the box will then be emptied again. Subsequently, the box will be set all the way at the east end and the process will be repeated.

Once the corridor is cleared up to the crowder breakdown point the operation will be split in two. One team will continue to fish handle in front of the gate area, and the second team will begin to deconstruct the east side of the crowder. A newly developed angled screen and fyke net system will be deployed just prior to the second phase of basin dewatering. Once the angled screen is in place, the second phase of dewatering will commence, and the basin will be drawn down to a depth of 22 inches and falling. As the water level reaches the top of the lowermost gate truss cord the manual fish handling will begin in the gate area.

Working from west-to-east following the volition of the water heading to the pump shed the gate screen sections and the associated section fykes will be used simultaneously. Using dip nets and water volition the sections will be cleared into fykes, which will be monitored and the collection boxes exchanged as necessary to limit overcrowding. The angled screen fyke will also be closely monitored as the level in the basin drops to limit overcrowding the collection box. As the water level continues fall, careful monitoring of velocity will be conducted so as to ensure the maximum flow velocity of 0.4-ft per second is not exceeded, and does not cause harm or fish impingement on any of the



screens. The collection boxes will be closely monitored throughout the completion of the basin dewatering until such time as the fish are all collected or resulting efforts no longer yield any appreciable count.

Appendix N

Key Roles, Responsibilities, and Contact Information



Appendix N Key Roles, Responsibilities, and Contact Information

| Name and Title | Contact Information | Responsibilities |
|---|---|--|
| Project Director: Phil Wallace | Phil.Wallace@kiewit.com (206) 793-5663 | Overall project responsibility Adaptive management |
| General Superintendent: Jeff Billows | Jeff.billows@kiewit.com 206-255-2657 | Management of casting basin operations, during draining and fish handling Adaptive management |
| Environmental Compliance Manager: Norma Hernandez | norma.hernandez@kiewit.com 602-516-3817 | Oversees job-specific environmental compliance program, basin water sampling, and testing Ensures permit compliance |
| WSDOT Directing Biologist: Chris Cziesla | CzieslC@consultant.wsdot.wa.gov (206) 321-6537 | Oversight of fish monitoring, enumeration, and identification Adaptive management |
| Fish Handling Operations: Kiewit-General Staff | Not applicable | Opening and closing of the casting basin gate Seine net, block net Power crowder operations Fish box operations Skiff operations |
| Fish Herders: Kiewit-General Staff | Not applicable | Manual fish herding and crowding |
| Fish Monitors: WSDOT Staff | Not applicable | Counting and enumeration of fish in the casting basin Identification of listed species |

Appendix O

Prolonged Immersion Special Procedures



Appendix O

Special Procedures to implement during the delayed gate re-installation after Cycle 6 Pontoons Float-out

During Cycle 6 Pontoons Float-Out, Kiewit-General plans on performing maintenance and repair work on the casting basin gate structure after it is pulled out from the basin for the Cycle 6 pontoons float-out. During previous pontoon float-out cycles, the gate structure was typically reinstalled in the basin as soon as possible after the pontoons were tugged out into the launch channel/Grays Harbor. However, Kiewit-General has estimated that the gate structure maintenance and repair work required for Cycle 6 will take up to two weeks to complete, which means that the casting basin will remain open to the harbor waters for that amount of time. In light of this change to the standard float-out procedures, this addendum has been added to the Fish Handling Plan. The special procedures are described below.

Block Net: After the gate structure is pulled out from the basin, and all the pontoons have been tugged out to the launch channel, KG will not install the block net. The block net is typically installed to minimize fish entry into the basin from the launch channel before re-installing the gate structure. However, in this case, the block net would effectively trap fish in the basin for up to 2 weeks, which could present food, refugia (predator avoidance), and water quality stresses for fish in the basin. Additionally, if the block net were to stay in place for 2 weeks, maintenance of the net would be necessary to avoid damage from debris and accumulation of debris on the net, and may need to be replaced if significant damage is incurred.

Monitor the water quality in the basin: Although the water in the basin will flow freely from the harbor with the tide cycles, and the fish will be able to swim in and out, KG will monitor the water quality inside the basin at least once a day, and compare to water quality out in the channel. KG anticipates that the water quality inside the basin will be equivalent to what occurs out in the launch channel/harbor. Parameters to be monitored will be turbidity, temperature, and dissolved oxygen. Readings will be taken twice a day (morning and afternoon) at points "B1" and "E" as designated in Figure L.1 of Appendix L, "Casting Basin Water Data Collection Plan". This data will be recorded in the Field Reporting Form found in attachment L.1 of Appendix L.

Eliminate all discharges to the basin: KG will ensure that no process water is discharged to the basin during this time, and throughout the fish handling process. The project personnel will be instructed to be vigilant of work activities near the basin so as to



contain any process water and/or spills, and to understand that the water in the basin is considered Waters of the State. Any spill, including oil sheens, are Reportable Spills.

Fish Handling: Additional sediment accumulation in the basin will be expected, possibly as much as 6 inches of additional material deposited in the basin. This potential has been mitigated by the maintenance dredging of the launch channel that was completed on February 23, 2015 (two weeks before float-out). KG will implement the same fish handling methods and equipment as described in the Fish Handling Plan. Operation of the power crowder will likely be more difficult if excess sediment accumulates in the basin, and KG will stage a forklift nearby in case it is needed to push or re-align the power crowder as it travels down the basin.

The float-out is scheduled to start March 9th, at which time the gate structure shall be removed from the basin. The basin will be open to the launch channel/harbor for up to 2 weeks, while the gate structure undergoes repairs and maintenance. Before re-installing the repaired gate structure back in the basin, KG will first seine the basin to direct fish out of the basin. As the seine passes through the basin gate opening, KG will begin re-installing the gate structure. After the gate is re-installed, KG will begin dewatering the basin as described in the Fish Handling plan, followed by fish handling efforts as described in the plan.